



ENT

(Ear-Nose-Throat)

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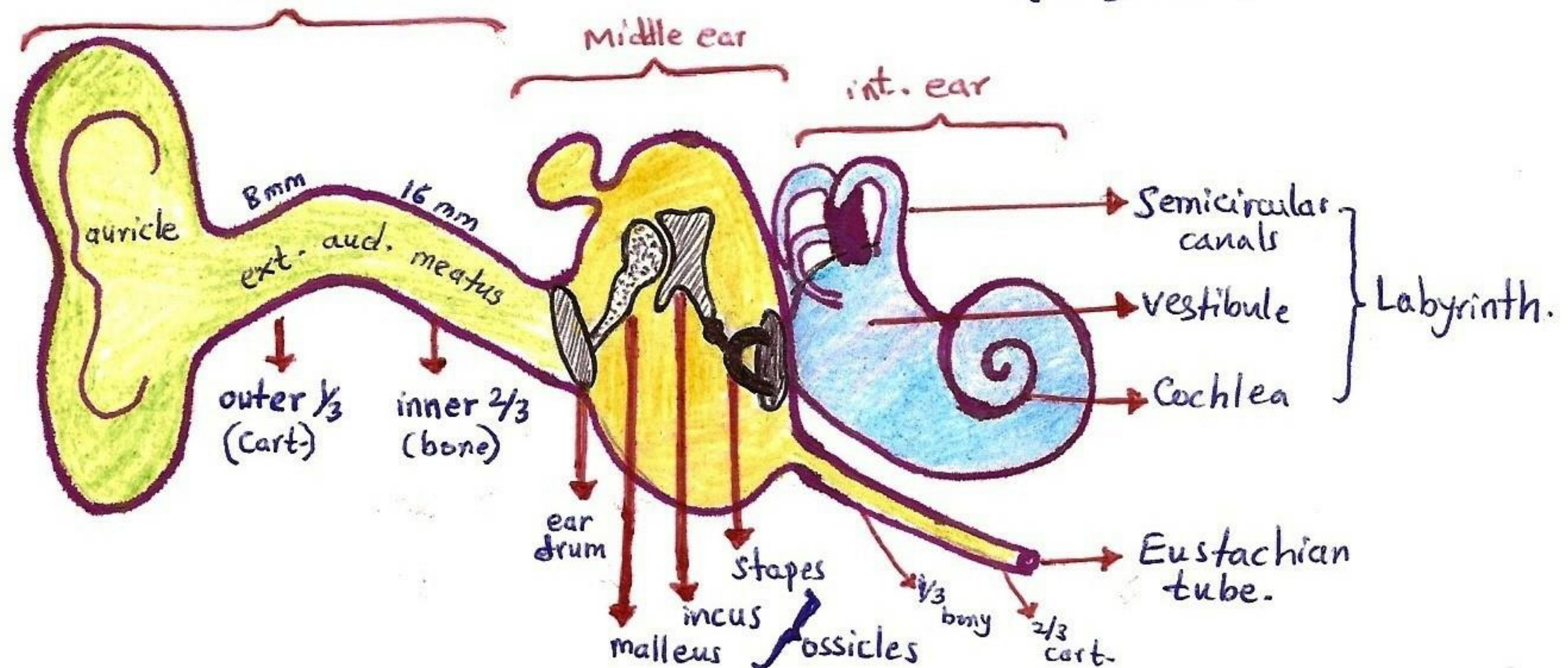
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VISIT...

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THE EAR

- The ear consists of
- external ear.
 - Middle ear. (tympanic cavity) -
 - internal ear. (Labyrinth) -



EXTERNAL EAR:

①*The auricle: - formed of elastic cartilage (except lobule has no cart.)

- It collects the sounds.

- It supplied by - auriculotemporal n. (upper 1/2 outer surface) - Lesser occipital n. (" " inner ") - Great auricular n. (lower 1/2 both sides).

②*The External auditory meatus: it is about inch (24 mm)

- Its outer 1/3 is cartilagenous & directed upward & back wards

- Its inner 2/3 is bony (16 mm) & directed downward & Forwards.

③*The ear drum: (tympanic membr.)

* It separates middle ear from ext. auditory meatus, about 10 mm X 8 mm

* Its oblique [facing laterally, downward & forward]

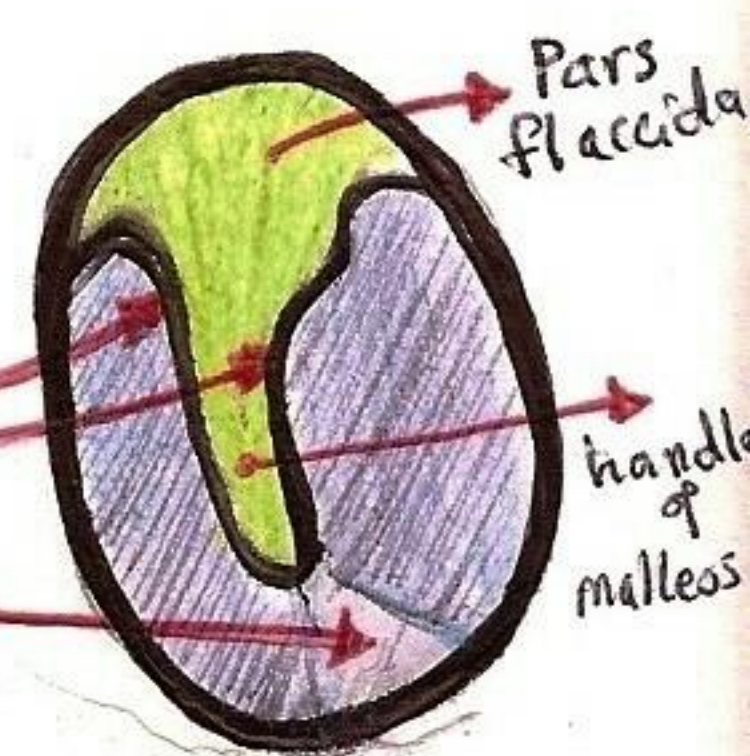
* It consists of Pars flaccida & Pars tensa, they are separated by 2 fold (ant & post. malleolar folds)

- the antero-inferior quadrant of drum called cone of light because it reflects light of examiner's torch.

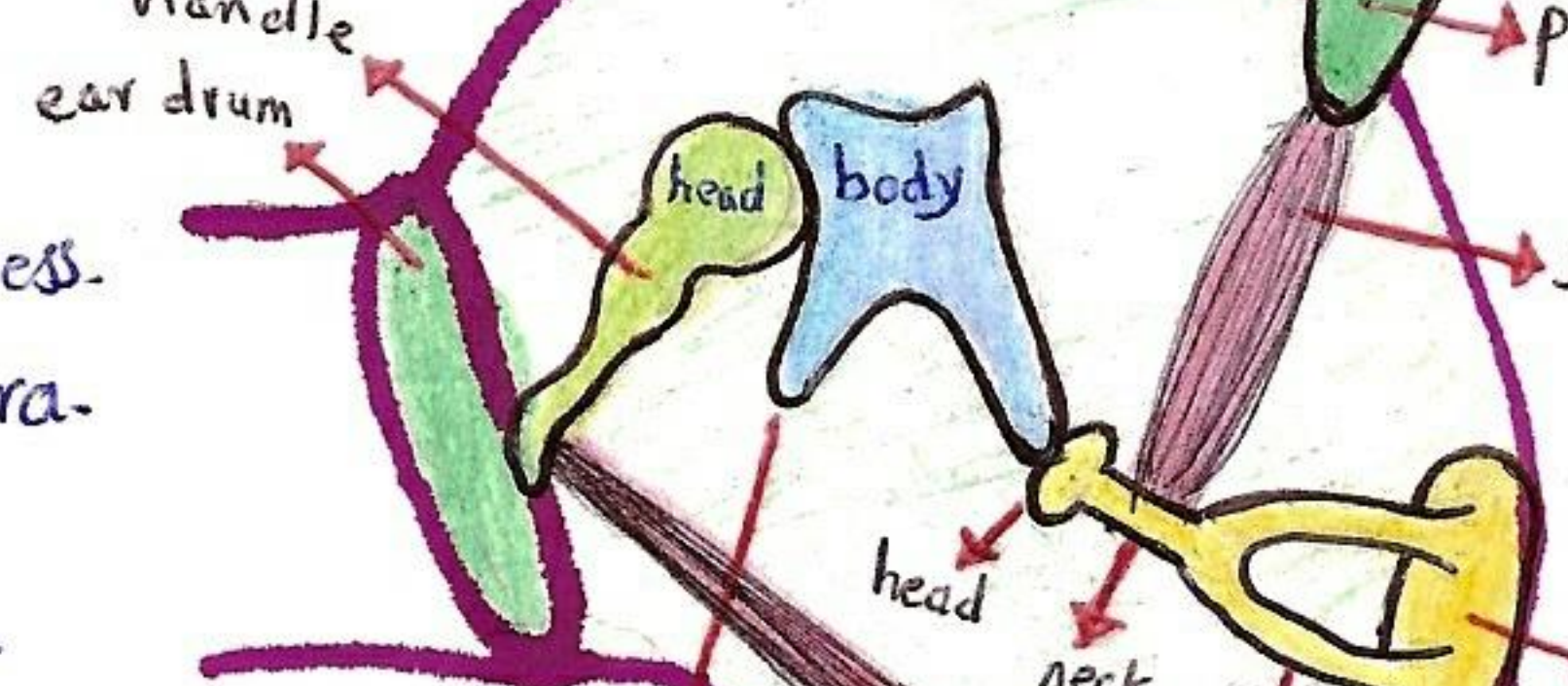
* The drum wall is formed of

- outer layer → skin (ectoderm)
- Middle → fibrous tissue (meso) [absent in Pars flaccida]
- inner → mucous memb. (endo).

* N/s → outer surface by auriculotemp. - inner by tympanic plexus (glossopharyngeal n.)



MIDDLE EAR: (tympanic cavity) = consists of :

- ① 3 ossicles
- Malleus
 - head
 - handle
 - incus
 - body
 - Short & long process.
 - Stapes
 - ant. & post crura.
 - head & neck
 - foot of stapes.
- ② 2 muscles
- stapedius (N/s - n. to stapedius - Facial)
 - Tensor tympani (n. to med. pterygoid - mandibular n.)
- ③ 2 nerves
- chorda tympani → from facial
 - tympanic plexus (formed by tympanic br. of glossopharyngeal n. and symp. n. from plexus around ICA)
- ④ air inside the cavity.
- 

INB The tensor tympani & stapedius ms. acting as damping down the intensity of high pitched sounds by preventing excessive movement of drum & stapes respectively.

Q8 - The Eustachian tube (pharyngo-tympanic tube) is 36 mm long consist of $\frac{1}{3}$ bony part (12 mm) & $\frac{2}{3}$ cartil. part (24 mm).
- it connects nasopharynx with tympanic cavity (ant. wall).

- * The middle ear lies inside petrous part of temporal bone.
- * It is a biconcave box consists of roof, floor & 4 walls (ant. post. - Med. lat)

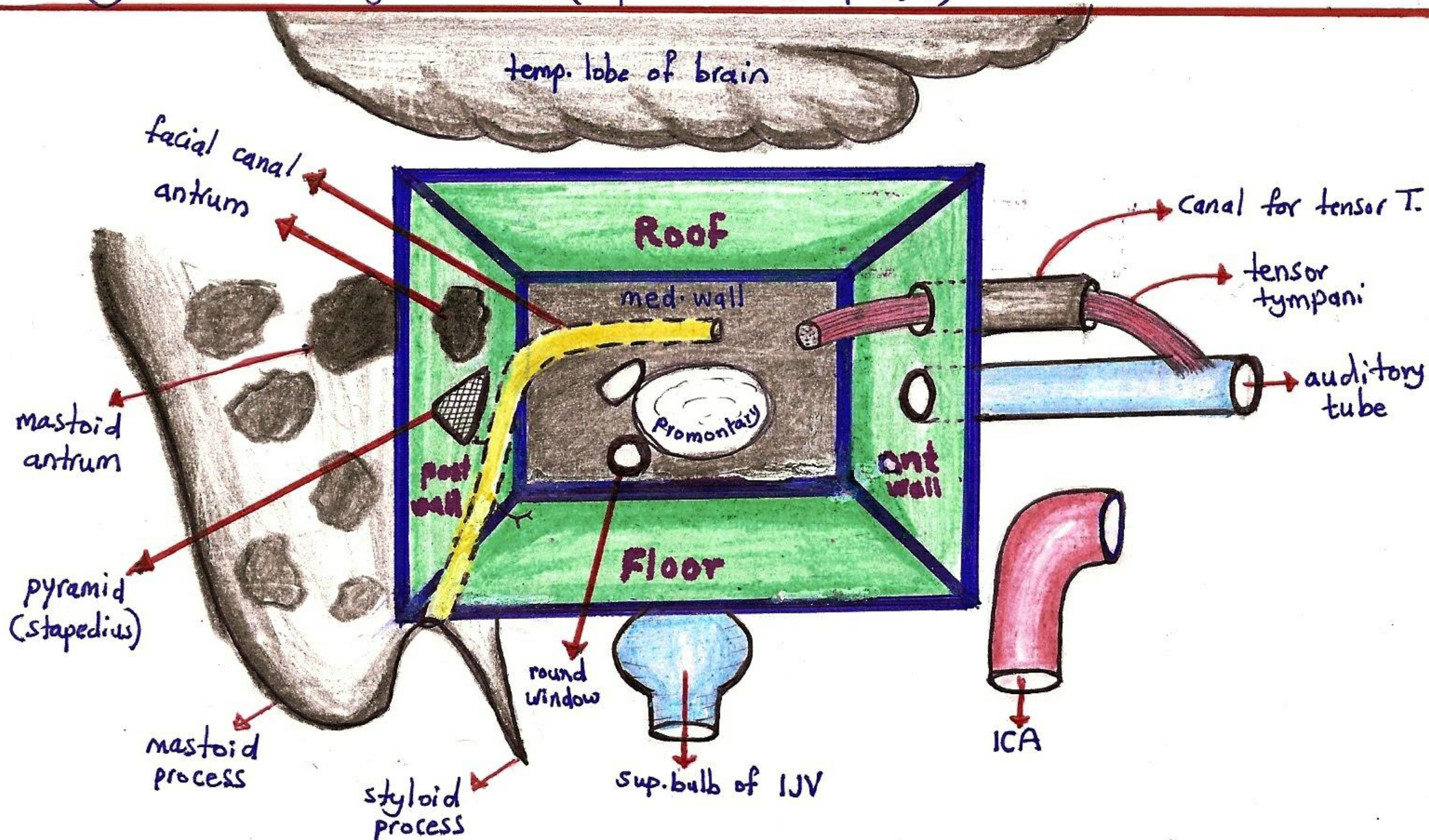
* RELATION OF MIDDLE EAR :

- ① Roof :- temporal lobe of brain (in middle cranial fossa).
- ② Lateral :- ear drum.
- ③ Medial :- Promontory (elevation of cochlea)
 - oval window (above & behind promontory) - closed by foot of stapes.
 - Round window (below & " " " ") - " " 2nd tympanic membrane.
 - horizontal part of facial canal (formed by facial n.)
- ④ Posterior :-
 - Vertical part " " " " " "
 - Pyramid (process contains stapedius)
 - aditus (opening into mastoid antrum).

} from below upward

- ⑤- Anterior wall: - opening for tensor tympani canal } from above
 - " " Eustachian tube } downward.
 - Carotid canal (ICA).

- ⑥- Floor:- Jugular fossa (superior bulb of IJV)



INNER EAR : (Labyrinth)

• It lies inside petrous part of temporal bone & consists of:

- ① Bony labyrinth :- consist of - Semicircular canals, vestibule & cochlea.
- ② Membranous " :- " " - Semicircular ducts, utricle and sacculle & cochlear duct.

[NB] - the semicircular canals are (superior, post. & lateral).

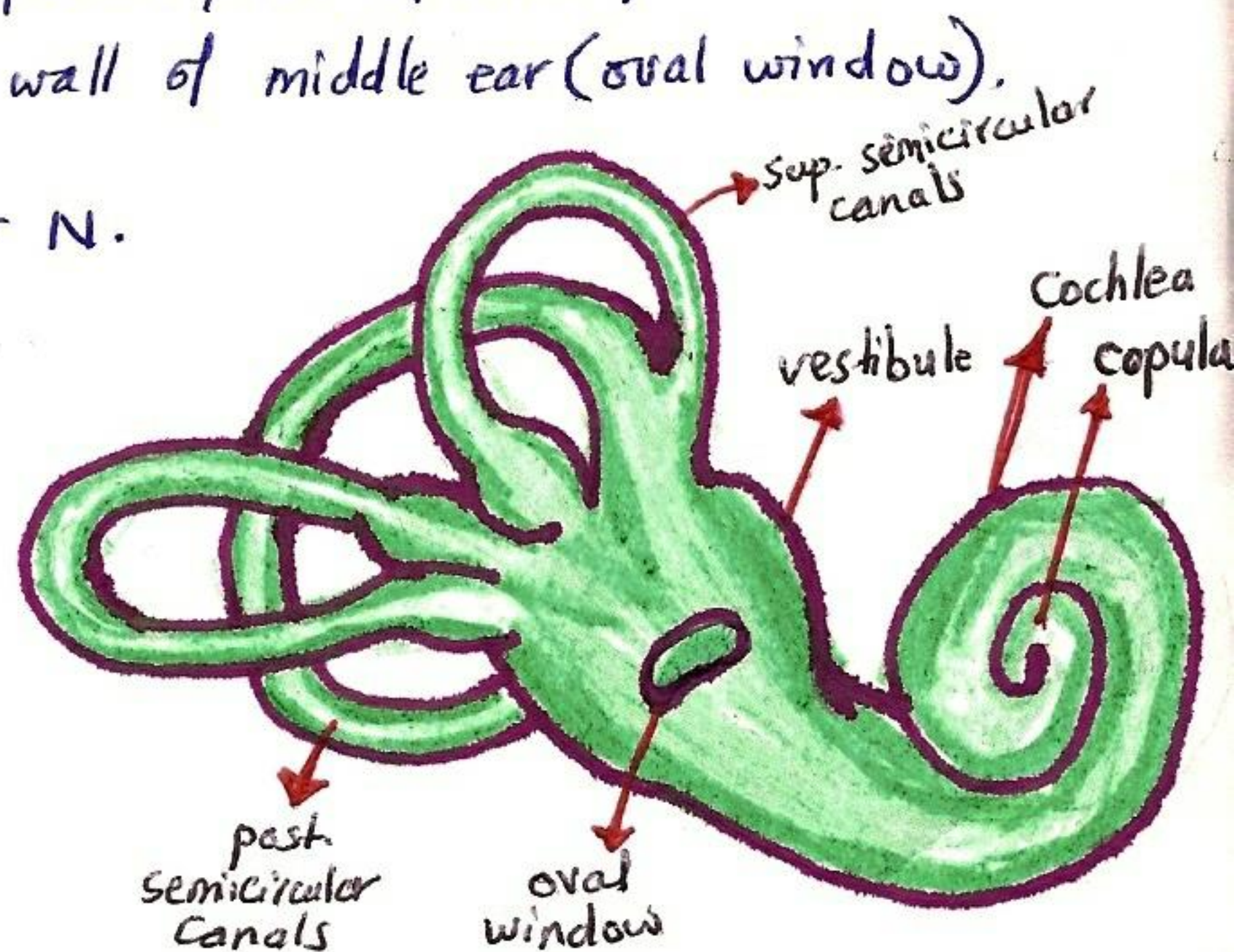
[NB] - the vestibule related to medial wall of middle ear (oval window).

* Nerve supply of labyrinth - vestibulo-cochlear N.

* Blood supply of labyrinth - by

- ① labyrinthine br. of basilar a.
- ② stylomastoid br. of post. auricular a.

• Venous drain into sup. petrosal sinus or transverse sinus.



SYMPTOMS & SIGNS OF EAR DISEASES

① Deafness

④ Tinnitus

② Pain, headache

⑤ Vertigo

③ Discharge.

⑥ Facial palsy.

① * DEAFNESS

* **Definition**:- diminution or loss of hearing (unil. or bilateral).

* **Normal range of hearing**:-

• Frequency of voice: 20 - 20,000 Hz

* **Types of deafness**:-

① Conductive deafness.

② Sensoryneural (Perceptive) deafness.

③ Mixed deafness

④ Cortical deafness

⑤ Non functional (malignant).

* **Causes of conductive & sensory deafness.**

Conductive deafness	perceptive (sensory) deafness
① Congenital dis. e.g. microtia, atresia, otosclerosis , cystic fibrosis, immotile cilia syndrome	① Congenital dis.:- e.g. - Intrauterine infection (TORCHs) - toxic drugs to mother.
② Tumours:- e.g. • exostoses, • Glomus jugulare [benign tumour of jugular vein] • Glomus tympanum [benign tumor of new B.V inside drum]	② Tumours:- e.g. • acoustic neuroma [benign tumour of vestibulocochlear N.] [cerebropontine angle tumour] [schwannoma].
③ Inflammation: e.g. ^{& externa} acute & chronic otitis media	③ infection
④ Trauma: e.g. ^{haemotympanum} drum perf., skull	④ of skull
⑤ others:- e.g. wax, FB	⑤ others:- • Meiniers disease • Ototoxic drugs • hyperbilirubinemia • hyperlipoproteinemia • hypothyroidism • CNS dis. (MS) • occupational

N.B.: • **toxic drugs** are
Gentamycin, frusemide,
salicylate, cytotoxic drugs
antimalaria, anti TB. irradiation

NB- Glomus jugulare tumours are classically described as benign tumours with a long time course often measured in decades. Although these tumours may be locally invasive, most cases are histologically benign and metastases are rare. The case of a malignant glomus jugulare tumour with a particularly aggressive pattern of spread is presented. At the time of surgery, which was within 12 months of the development of symptoms, intracranial spread and metastasis to cervical lymph nodes had already occurred, demonstrating that glomus jugulare tumours are not always benign.

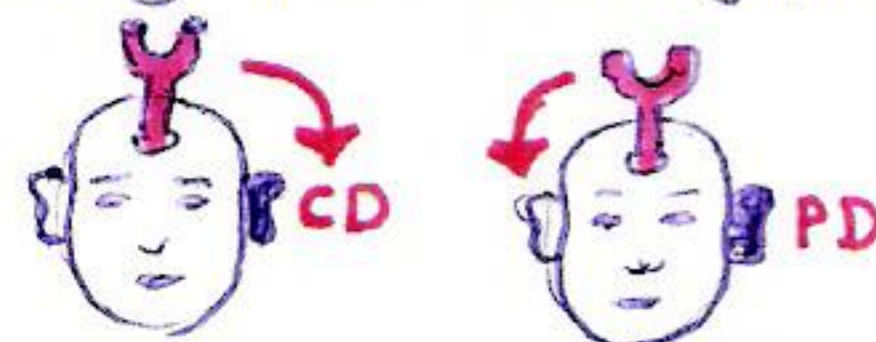
* TESTS OF HEARING

(A) **Rennie test**: comparing air conduction & bone conduction of the same ear (512 Hz)

- Normally air cond. better than bone. $[AC > BC]$
- In CD "conductive deafness" $\rightarrow BC > AC$
- In PD "Perceptive deafness" $\rightarrow AC > BC$ "but both reduced"

(B) **Weber's test**: comparing bone conduction in both ears by placing fork in midline of forehead "normally no lateralization"

- In CD: hearing better in diseased ear.
- In PD: hearing better in normal ear



(C) **Schwabach's test**: comparing bone conduction of patient mastoid with the examiner.

- In CD: hearing of patient prolonged $>$ examiner.
- In PD: " " " shortened $<$ " "

(D) **Audiometry**: Machine which record sounds on audiogram

- Tympanometry: indirectly measures middle ear pressure.

* OTOSCLEROSIS {cause of CD}

• **Definition & pathology**: - (autosomal dominant?)

- fixation (ankylosis) of foot plate of stapes by new (spongy) bone formed in the oval window $\rightarrow$ conductive deafness



• **Incidence**: - +ve family history in 2/3 of pt, & bilateral in 75%.

- $\text{♀} > \text{♂}$, age 15-30 yr. deafness $\uparrow$ during pregnancy (hormonal)

• **Symptoms**: - deafness ($\uparrow$ during pregnancy), tinnitus, ~~deafness~~

• **Signs**: - Drum normal ($\pm$ redness) (flamingo sign $\rightarrow$ non-specific), CD (NB: 90% occur in oval window $\rightarrow$ CD, but if in rounded window $\rightarrow$ PD)

• **treatment**: - • Stapedectomy & replace by teflon wire.

~~Stapedectomy & replace by teflon wire.~~

* MENIERE'S DISEASE {cause of PD}

• **Definition**: - It is a hydrops of the membranous labyrinth i.e. excessive accumulation of endolymph $\rightarrow$ attacks of vertigo, deafness & tinnitus

- unknown cause (but may be due to $\uparrow$ secretion OR $\downarrow$ drainage of endolymph)

● **Incidence** :- commonst cause of vertigo ^{old age} usually unilateral.

● **Cause** :- unknow but may be due to :

- Increase secretion or ↓ absorption of endolymph.
- Allergy - salt & water retention

● **E/P** :- recurrent attack of triad of symptoms

- attacks lasts minutes to hours. (20m - 24 hrs)
- and remission can be up to 1 year.

- associated with Nystagmus (horizontal never vertical)



NB : Pt. have Perceptive deafness which in early stage reversible but late may becomes stable PD.

● **treatment** :-

● **Medical** :- sedatives & reassurance

- Vasodilators & loop diuretics, salt & water restriction.
- Anti-vertigo drugs (eg Dramamine, Stugeron, ...)

● **Surgical** :- If bad hearing → Labyrinthectomy.

- If good hearing → decompression of lymphatic sac
→ selective destruction of VIII CN to decrease pressure inside labyrinth

● hearing aids.

② * EAR DISCHARGE "otorrhea"

* **Types** :

(NB : Ear pain = otalgia or earache)

① Watery :- e.g * base of skull → CSF discharge.

② Purulent (Pus) :- e.g cholesteatoma, Furunculosis [NB No mucoid cells in ext. ear]

③ Mucoid or mucopurulent :- e.g - acute otitis media

- chr. supp. O.M (tubotympanic type),

④ Bloody :- e.g - Traumatic rupture of drum.

- inflammatory : Myringitis, otitis media.

- Tumours :- e.g sq-cell ca, Glomus jugular (malignant tumor of jugular bulb)

NB :- Balance of body depends on input from :

① peripheral vestibular apparatus

② visual system

③ cerebellum

④ proprioceptive system

NB :- Endolymph (↑K, ↓Na) while exolymph (↓K, ↑Na).

DISEASES OF EXTERNAL EAR

* CONGENITAL DISEASES:

- ① Microtia (small auricle)
- ② Macrotia
- ③ accessory auricle ^{or absence}
- ④ Protruding ear
- ⑤ Preauricular cyst
- ⑥ Preauricular fistula
- ⑦ Cong. atresia of external canal (causing conductive deafness).

* WAX: "cerumen = is colourless secretion, becomes yellow by air"

- It is the accumulation of secretions of sebaceous & ceruminous glands of ext. canal (cartilaginous part).

• **Symptoms:-** ① Deafness (complete obst. of canal → cond. deaf.) ② Tinnitus.

• **Treatment:-** by washing, if was dry use glycerine bicarbonate or hydrogen peroxide drops before wash.

* FOREIGN BODY:

- Common in children & mentally retarded people.
- treated by ear wash, wash is contraindicated if FB is vegetable (swell with water) or impacted, so use a hook to extract. if this failed may use surgery (Post auricular incision)
- May Complicated by injury to drum or ext. canal and may cause otitis externa & otitis media.

* INFLAMMATION

(A)* FURUNCULOSIS:

Bacterial inf. → Localized otitis ^{externa} ~~media~~ (furunculosis)
Fungal (otomycosis) → Diffuse otitis externa

- It is a staphylococcal infection of a hair follicle of external canal.
- It is sometimes multiple & recurrent in diabetics.

• **Symptoms:-** Pain, discharge & deafness (if large obstruct the canal)

• **Signs:-** Tenderness, swelling, redness. (D/D = acute mastoiditis)

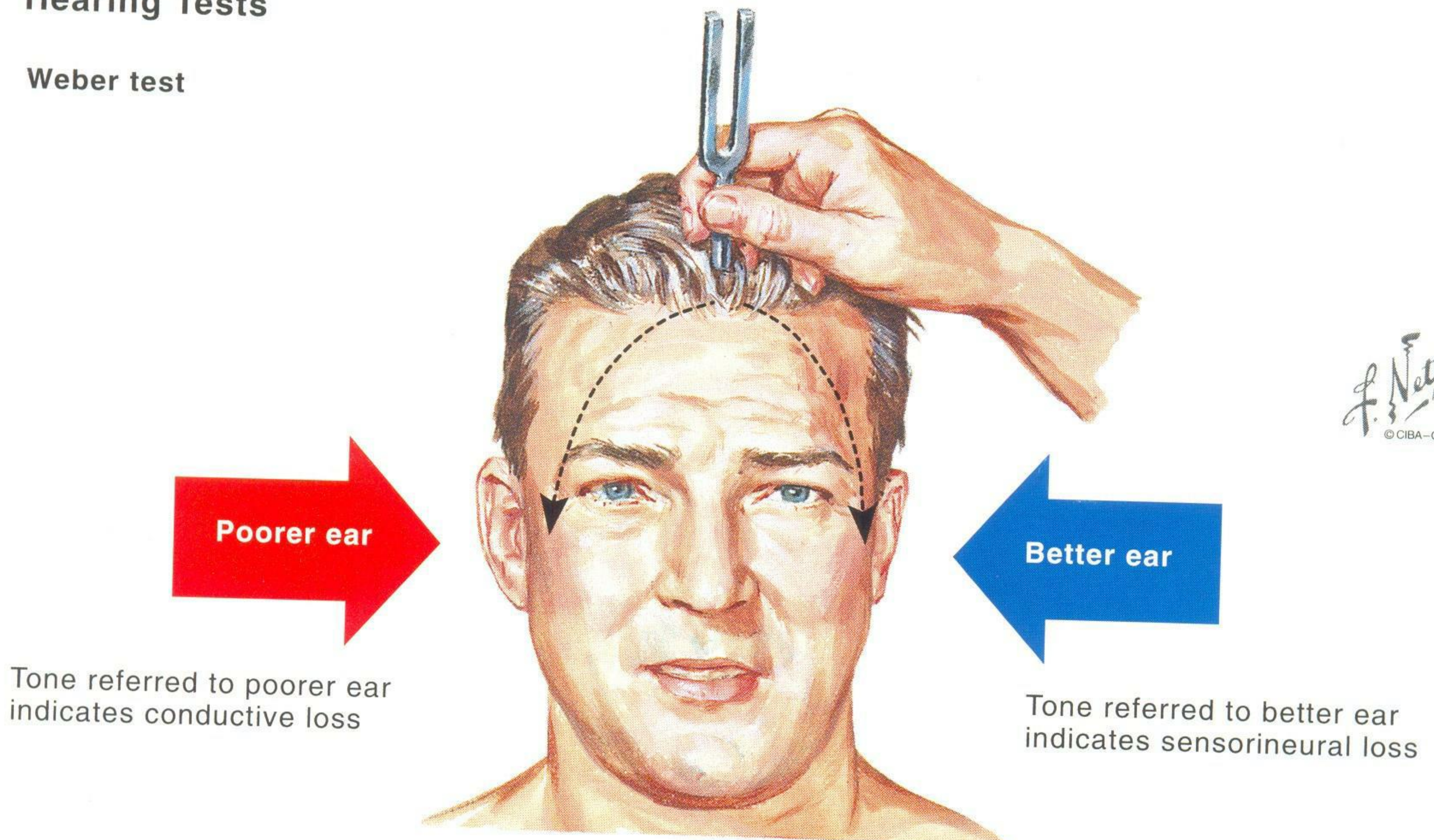
• **Treatment:-** antibiotics, analgesia, & if ~~abscess~~ abscess → Incision & drain
- a gauze-soaked in glycerine ichthylol (10%) may be used.

eg: Flucloxacillin, Ciprofloxacin ± steroids

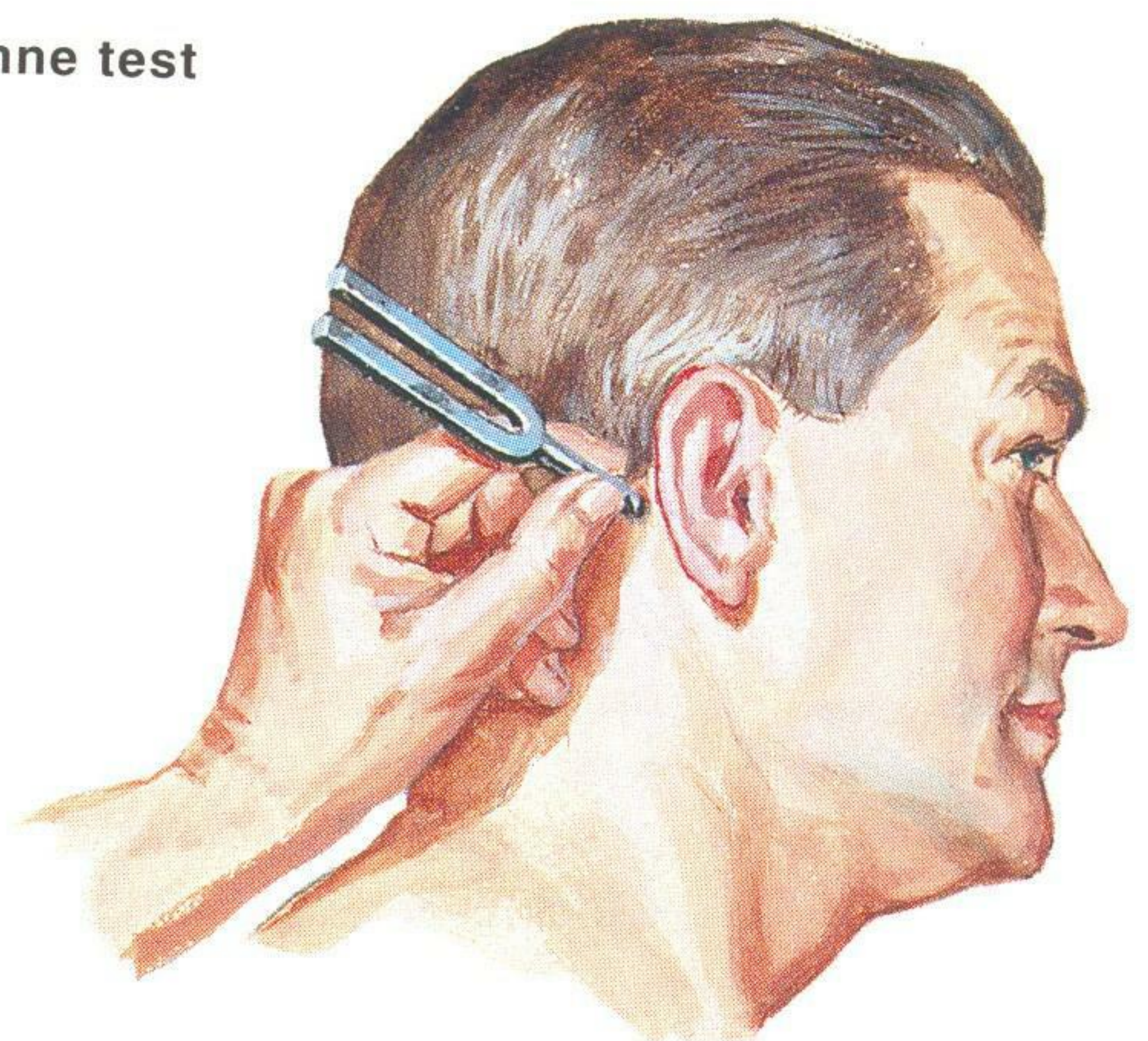
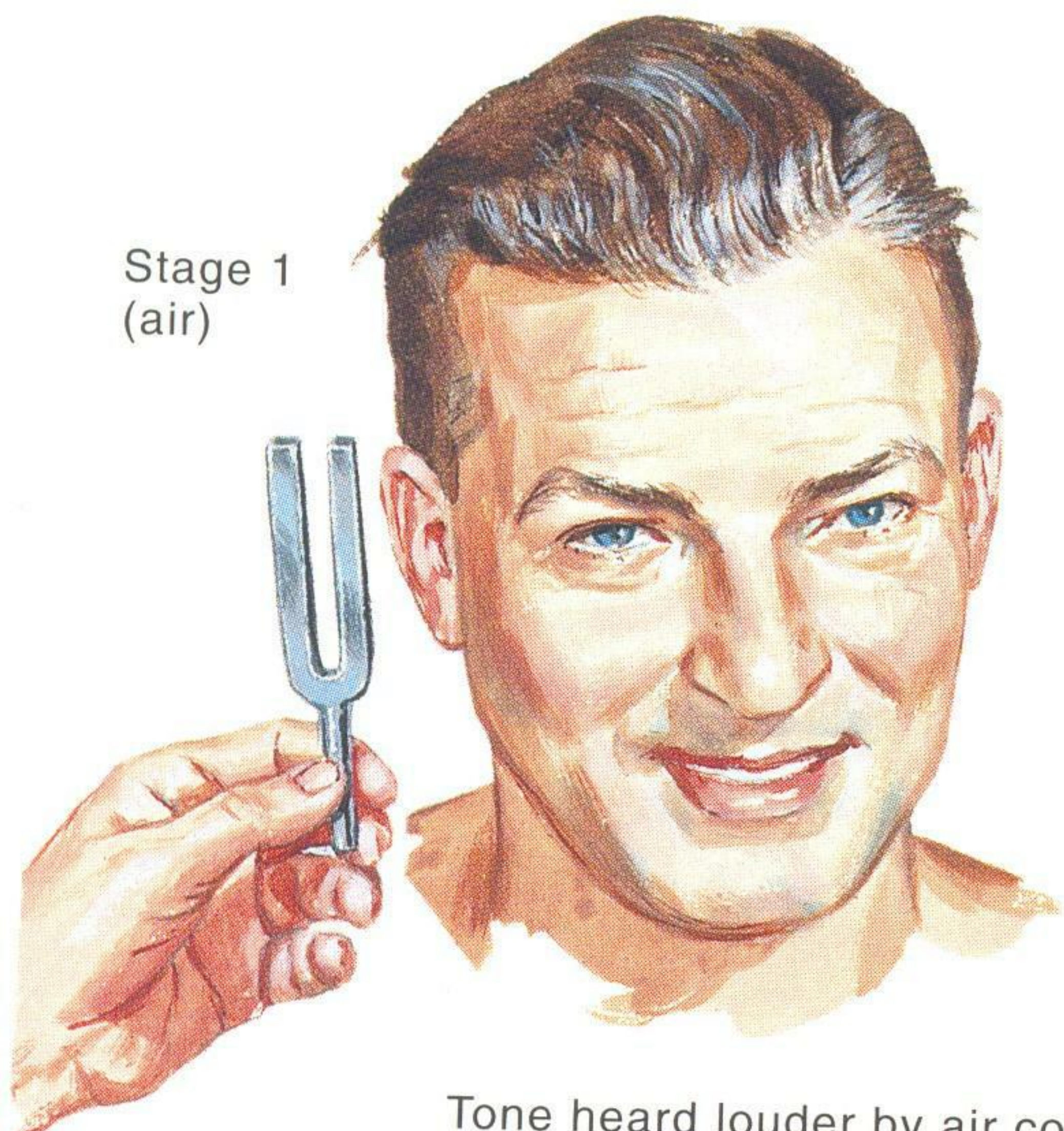
Ichthammol in glycerine 10%

Hearing Tests

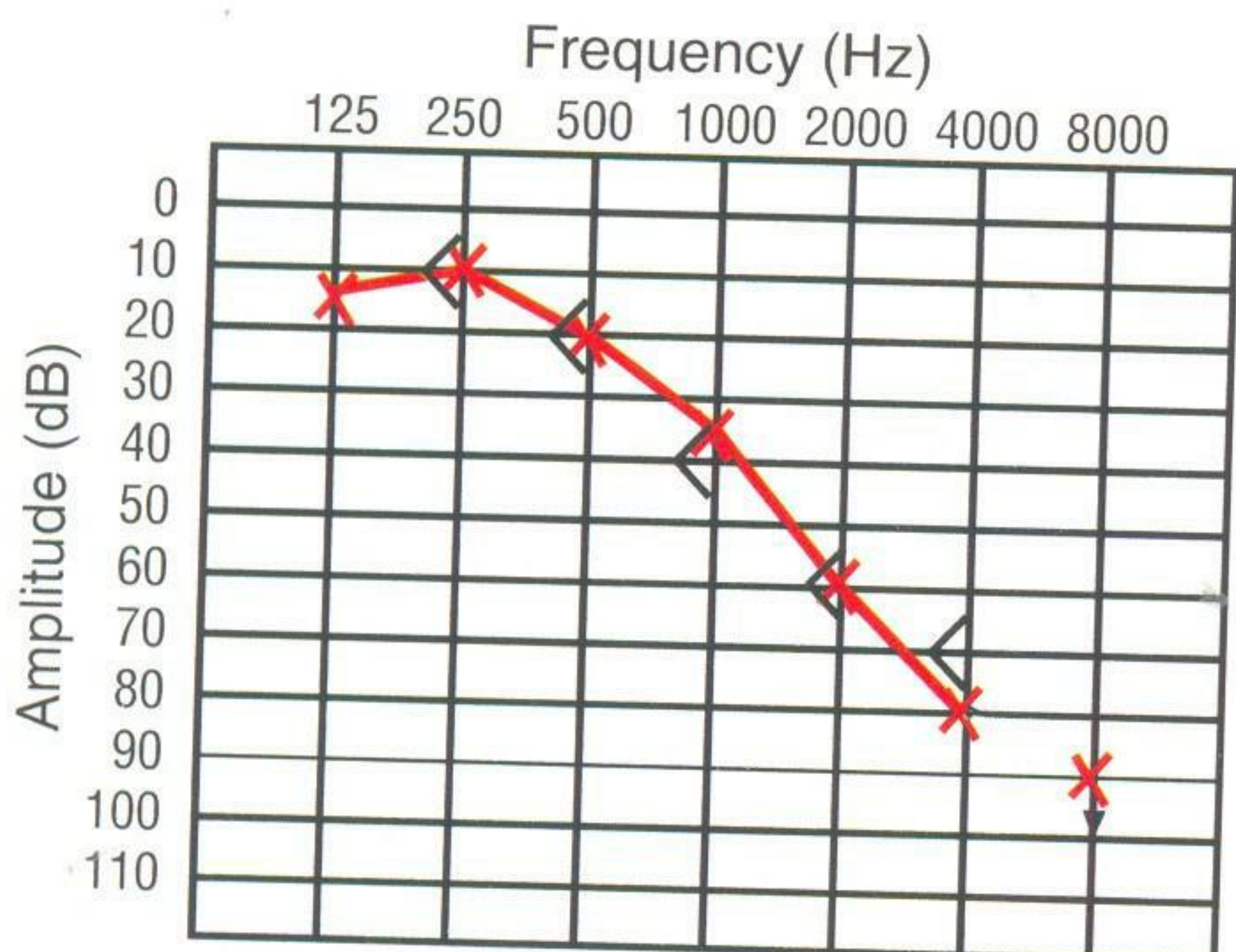
Weber test



Rinne test



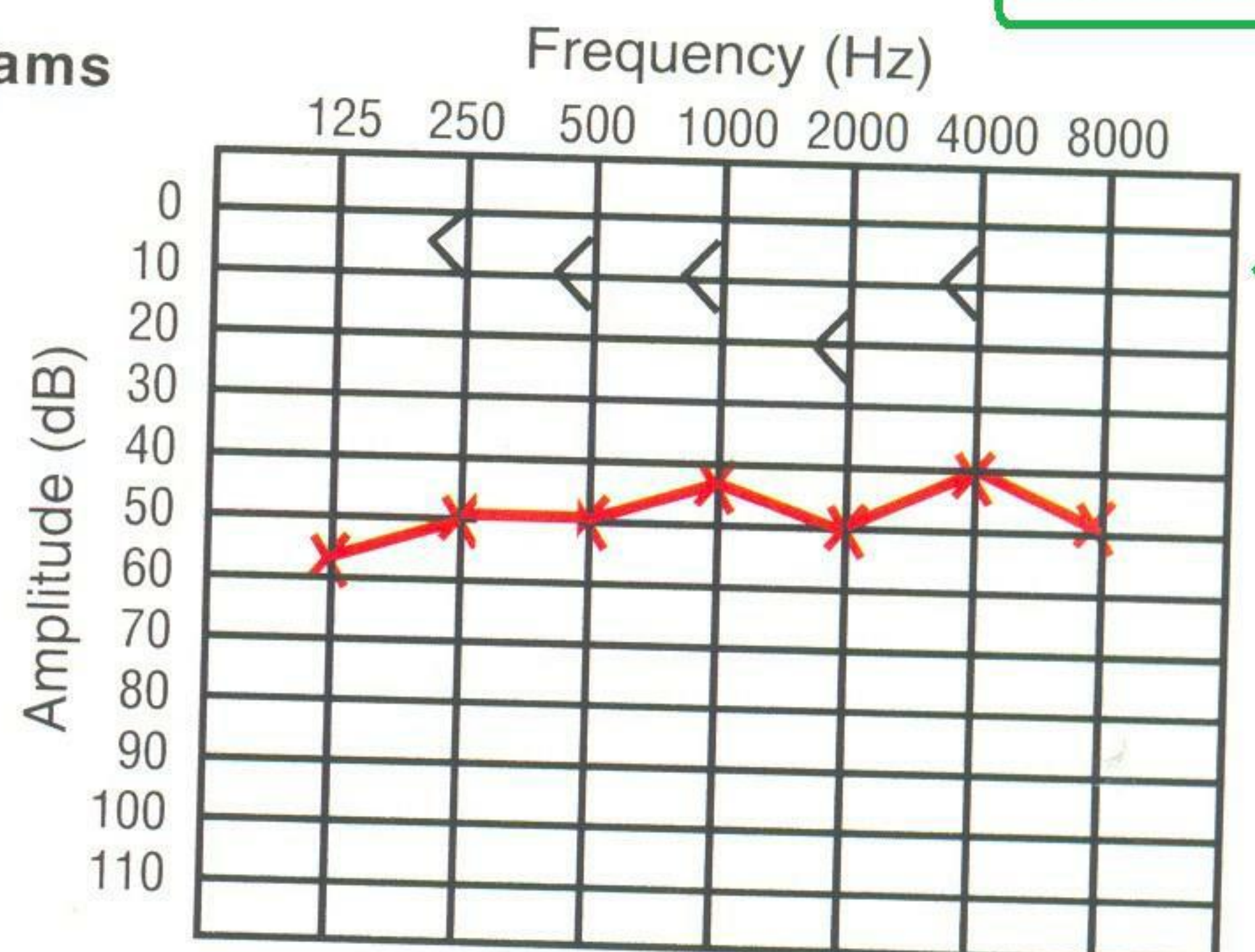
Tone heard louder by air conduction (Rinne +) = sensorineural loss
 Tone heard louder by bone conduction (Rinne -) = conductive loss



Air and bone conduction affected equally. Loss mainly in higher tones. Typical of presbycusis

Audiograms

AIR = X
 BONE = <



Pure conduction loss. Typical of uncomplicated otosclerosis

Bone air gap

OTO

(B) ONCOMYCOSIS :

- * definition:- fungal infection of external canal (e.g. aspergillus & candida albicans)
- * symptoms:- Pain, deafness^{slight} & itching. → Common in farmer
- * Signs:- white debris in the external canal ± black spots. ^{fungicide}
- * Treatment:-
 - removal of debris by cleaning or 1% salicylic acid ^{in alcohol} → keratolytic
 - antifungal drops (e.g. Nystatin) (mycozol)

(C) DIFFUSE OTITIS EXTERNA :

- * definition:- a diffuse inflamm. of skin lining the external auditory canal
- * Causes:-
 - Pyogenic organism e.g. strepto, staph, proteus, ...
 - Secondary to otitis media discharge.
- * Predisposing causes:-
 - Diabetics, allergies, local trauma (scratching)
 - excessive sweating & swimming (hot humid → ↑ inflamm.)
- * symptoms:- Pain, deafness (slight) & Discharge (scanty & purulent)
- * Signs:- Tenderness, swelling, redness (if chronic → thick stenotic canal).
- * Treatment:-
 - antibiotics, analgesia. → aluminium acetate 8% (in acute cases)
 - a gauze-soaked with → hydrocortisone & antibiotic (in chronic case)

* WASHING OF EAR

- * Indication:-
 - ① Wax.
 - ② F.B
 - ③ Debris removal in infection
 - ④ caloric test
- * Contraindication:-
 - ① Perforation of drum (traumatic or in otitis media).
 - ② Diffuse otitis externa → if Pt felt pain, vertigo or blood comes out
 - ③ F.B (if large vegetable or impacted)
 - ④ Fistula in otitis media.
- * Complications:-
 - ① Injury to drum. or canal.
 - ② Infection (e.g. otitis externa & media)
 - ③ Stimulation of inner ear → vertigo & nystagmus.
 - ④ Stimulation of vagus nerve → cough & vasovagal attack

* TUMOURS OF EXT. CANAL

- The commonest is exostosis (bony growths).
- it may obstruct the canal → conductive deafness.
- Tumours may be
 - Benign → exostoses (osteochondroma), papilloma, hemangiomas
 - Malignant → basal cell ca., sq. cell carcinoma

* TRAUMATIC RUPTURE OF DRUM

- * **Causes** :
- A) Indirect trauma
- ① otitic barotrauma
 - ② blow by Palm of hand (commonest cause).
 - ③ blast injury (explosion).
- B) Direct trauma
- ① iatrogenic (during washing or F.B removal)
 - ② Self inflicted (during ear cleaning).
 - ③ fracture base of skull extending to drum.

* **Symptoms** :- Pain (slight), deafness, tinnitus, bleeding, vertigo (rare)

* **Signs** :- the air comes out from ear on blowing (whistling sound).

- Perforation seen by otoscope

* **Treatment** :- Medical :- antibiotic (Prophylactic), [do not use any drops inside ear]

- Surgical :- (most perforations closes $\approx$ 3 weeks) if not or if it is large close it by a graft from temporalis fascia, this is called **myringoplasty**.

* **D/D** :- Pathological rupture of drum (due to otitis media).

	Cause	Discharge	Site	Size	Shape	Edge
Traumatic perforation	trauma	usually absent	always in Pars tensa	usually small	irregular or triangular	thin, surrounded by hemorrhage or congestion
Pathological perforation	otitis media	usually present	in Pars tensa or flaccida	usually Large	regular usually	thick surrounded by pus

NB :- traumatic perf. if 2^{ry} infected difficult to differentiate from traumatic.

OTITIC BARO-TRAUMA:

- It is trauma to the ear by atmospheric pressure changes^{eg} during descent in an aeroplane specially if $\bar{E}$ obstruction of eustachian tube (allergy, deviated septum, infection...)
- It leads to middle ear effusion and may cause drum perforation by high pressure outside [normally avoided by $\uparrow$ ing pressure inside middle ear by eustachial tube].
- Can be prevented by avoid flying while nasal is obstructed & avoid sleeping ~~and~~ during descend (to swallow & do valsalva's method to open the tube)
- Treated by - Myringotomy if $\bar{E}$ fluid.
- Myringoplasty if large perforation.



DISEASES OF MIDDLE EAR

* ACUTE OTITIS MEDIA

* **Definition:** It is acute inflammation of mucous membr. lining the middle ear cleft (middle ear, eustachian tube & mastoid air cell)

* **Causative organism:-** commonest is (streptococci), staph, hemoph. infl.

* **Routes of infection:-**

① Through eustachian tube:-

A - upper resp. infection → adenitis

commonest cause.

• Nose → acute rhinitis (common cold) on blowing of nose

• Sinuses → sinusitis

• Nasopharynx → adenoiditis

• Oropharynx → acute tonsillitis.

B - infected material passing through the tube (vomitus, milk, ...)

② Through external auditory canal (by traumatic drum)

③ Blood stream (v. rare)

* **Pathology & clinical picture:-** 5 stages:

	Stage I	Stage II	Stage III	Stage IV	Stage V
Definition	eustachian catarrh.	acute catarrhal otitis media	acute suppurative otitis media	stage of perforation	stage of recovery
Pathology	oedema of ET → closure of ET → absorption of air inside middle ear → drum retracts	inflammation include middle ear → exudation of serous fluid	fluid in middle ear becomes mucopurulent then Pus	necrosis of part of the drum → perforation	drum resolution & healing in 1 wk → 10 days if pus drained & good treatment
Symptoms	• Deafness • Tinnitus	• Deafness • Tinnitus • Pain	• Deafness • Tinnitus • Pain (throbbing) • Fever	• Deafness • Discharge → improvement of fever	improvement
Signs	- retracted drum	• Congested drum - conductive deafness - absence of light cone	- bulging drum - CD	• perforated drum - CD	• signs of healing

ET = Eustachian tube

* Treatment of acute otitis media :

1. Antibiotics, broad spectrum. (Amoxillin is ^{10 days} DOC) or erythromycin
2. Analgesics, antipyretic, good hydration.
3. Nil Per ear (if $\bar{t}$ perforation not use any ear drops).
4. If bulging drum $\rightarrow$ do myringotomy for drainage & do culture & sensitivity to discharge.

* Complication :-

1. chronic otitis media (secretory or adhesive)
2. Cranial : eg acute mastoiditis, facial palsy.
3. Intracranial.

NB :- Acute otitis media in infants & children is :- (2-5 yr)

- more common, because
 - eustachian tube wider, shorter, horizontal
 - URT infection eg tonsillitis is $>$ in children.
 - bottle-fed :- positioning of baby is supine $\rightarrow$ tube
 - more liable to infection
 - low resistance of infant
- infant is crying & rubbing the ear moving head from side to side

s/s $\rightarrow$ deafness, language delay, behavioural problems (irritable child, itchy ear)
dull, (or No symptoms).

CHRONIC OTITIS MEDIA

* **Definition**:- chronic inflammation of mucoperiosteum of middle ^{ear} cleft.

* **Types**:-

- chronic non-suppurative O.M. → ch. secretory O.M.
- chronic suppurative O.M. → ch. adhesive O.M.

A CHRONIC SECRETORY O.M.

* **Definition**:- chronic non-supp. effusion of middle ear & intact drum.

* **Aetiology**:-

- following acute O.M.
- recurrent tonsillitis & pharyngitis.
- Eust. tube obst. eg by adenoid. & allergy.

* **Pathology**:- obstr. of E-T → accumulation of secretion inside m.-ear.

* **Symptoms**:- ① Deafness (CD) ② Tinnitus ③ feeling of water inside ear.

* **Signs**:- by otoscope (intact drum _{slightly bulging}), by hearing test (CD)

- The drum may show fluid level & may be congested.

* **Treatment**:- (aims to prevent adhesive type).

- inflation of E.T. eg by catheterization of Politzer's bag.
- Myringotomy & insertion of Grommet tube (small drain tube)
- Treat underlying cause.
- Antibiotic.

B CHRONIC ADHESIVE O.M.

- It usually follows secretory type as fluid is organised into fibrous adhesions → limit movement of ossicles → conductive deafness (usually irreversible).

* **Treatment**:-

- best Rx is prevention because it is irreversible.
- Use hearing aids.

C CHRONIC SUPPURATIVE O.M.

*Definition: chronic inflamm. of middle ear cleft with discharge coming out through a perforated drum.

*Types: two types ① Tubotympanic ② Atticoantral.

	Tubotympanic	Atticoantral
Type	mucosal type	bony type (̄ cholesteatoma)
site	eustachian tube	attic & antrum.
prognosis	safe (respond to Rx)	unsafe (cholesteatoma eroding bone)
Causes	- usually 2nd to acute O.M - chronicity is due to ① inadequate Rx. ② high virulence of organism ③ low resistance of pt	Migration theory:- obst. of ET → -ve pressure inside M. ear → the drum is sucked in upper part → separation of a sac so skin is found in abnormal site (1st acquired cholesteatoma)
Symptoms	Deafness, tinnitus, Discharge	Deafness, tinnitus, discharge
signs	- Drum Perforation is <u>central</u> (centre of Pars tensa) - Discharge:- Profuse, mucopurulent → commonest symptom - CD (conductive deafness)	- Perforation is <u>marginal</u> or attic (ie in Pars flaccida). - scanty, purulent, foetid or of cholesteatoma (white epith. debris) - CD "by hearing test"
invest.	culture/sens. of discharge & x-ray mastoid central perforation	- same marginal perforation in drum
ttx.	- antibiotic, cleaning then - tympanoplasty after drainage of pus - Rx underlying cause	- mastoidectomy - tympanoplasty - antibiotic & cleaning.

is a type of cyst (epidermoid cyst)
NB: Cholesteatoma: is a sac with wall formed of keratinizing stratified squam. epith. it contain keratin & cholesterol crystals.
 - It may be 2nd infected ^{staph} → scanty pus → bone erosion by enzymes & pressure.

NB:- Attic: is the upper most part of middle ear into which the largest air cell of mastoid (mastoid antrum) opens.

* Complication of supp. O.M :-

(A) Cranial complication:-

- ① Mastoiditis
- ② Petrositis. (Inflam. of petrous part of temporal bone)
- ③ Facial paralysis
- ④ Labyrinthitis. ~~~~~> It is inflam. of labyrinth.

(B) Intra cranial compl. :-

- ① Extradural abscess.
- ② Brain abscess.
- ③ Meningitis
- ④ Lateral sinus thrombosis.

• C/P. → deafness (sensory), Tinnitus, Vertigo.
 • Fistula Sign : ↑ pressure in ext. ear
 (by Pneumatoscope or pr. at tragus)
 → brief vertigo & nystagmus.
 • It indicates fistula bet. middle ear & inner ear.

(C) Extra-cranial compl. :-

- ① Otitis externa.
- ② Jugular vein thrombosis
- ③ Bezold's abscess.
- ④ Retropharyngeal abscess.

① MASTOIDITIS :-

* Definition :- inflamm. of bony walls of mastoid air cells (osteitis)

* Pathology :- osteitis → bony^{wall} necrosis of mastoid → Pus inside → either pus goes to

- ① Post auricular → Pushing ear forward & downward
- ② Pre auricular → zygomatic abscess
- or ③ deep to sternomastoid → **Bezold's abscess**



* Cause :- Secondary to otitis media.

② PETROSITIS .

* Definition :- inflamm. of bony air cells of petrous part of temporal bone
 - usually affecting 5th & 6th nerves (related to petrous apex)

* C/P :- Gradenigo's syndrome : consist of

- ① Diplopia (6th n. palsy)
- ② Trigeminal pain (5th n. irritation)
- ③ Discharging ear.

* ttt :- antibiotic & Mastoidectomy + draining pus inside petrous cells

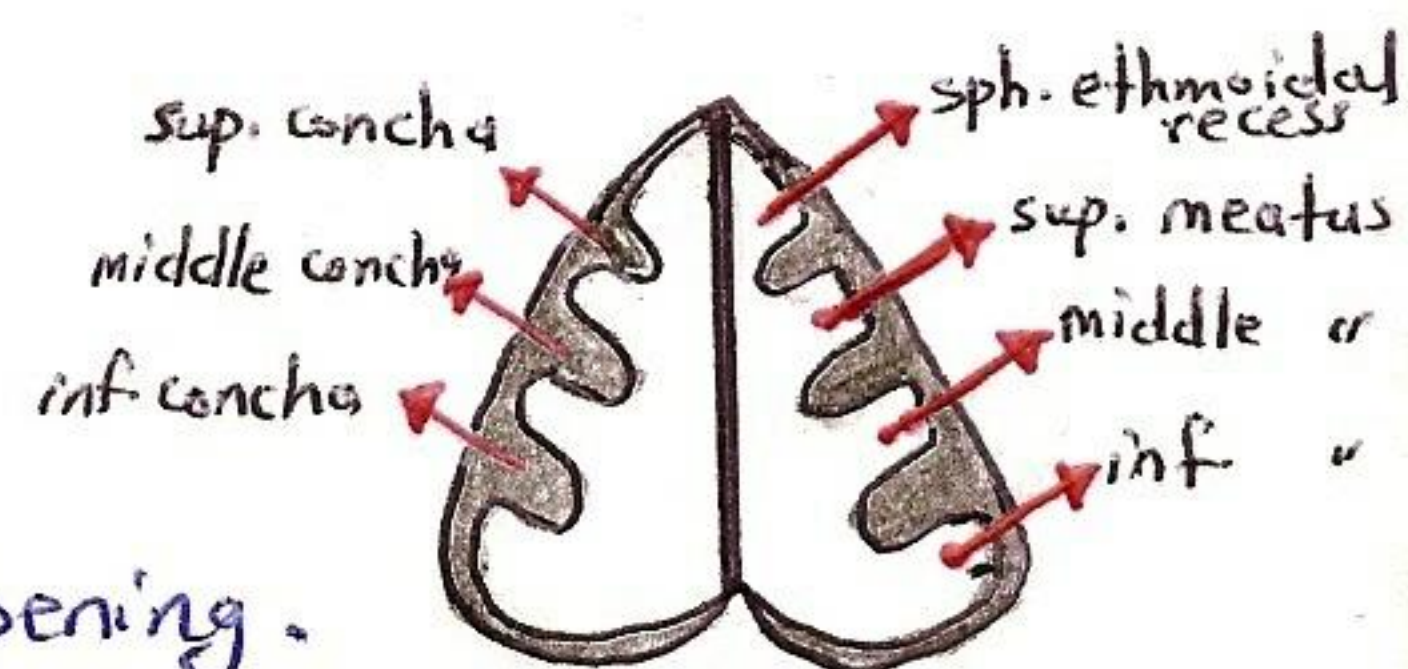
Nasal Cavity

- The nasal septum divides the nasal cavity into Rt & Lt halves & each cavity having ant. aperture (nares, nostrils) and post. aperture (choana) into nasopharynx.

* BOUNDARIES:

- Floor** :- formed by hard palate.
- Roof** :- formed from forward to backward by:
 - Nasal bone, (2) cribriform plate of ethmoid (3) - sphenoid body
- Medial wall** :- anteriorly → septal cartilage
 - Postero-superior → Perpendicular plate of ethmoid.
 - Postero-inferior → Vomer bone.
 } → nasal septum.
- Lateral wall** :- formed by 3 ^{bony} elevations (conchae) & 3 depression (meatuses) into which the paranasal sinuses open.

* NASAL MEATUSES :- spaces between conchae.



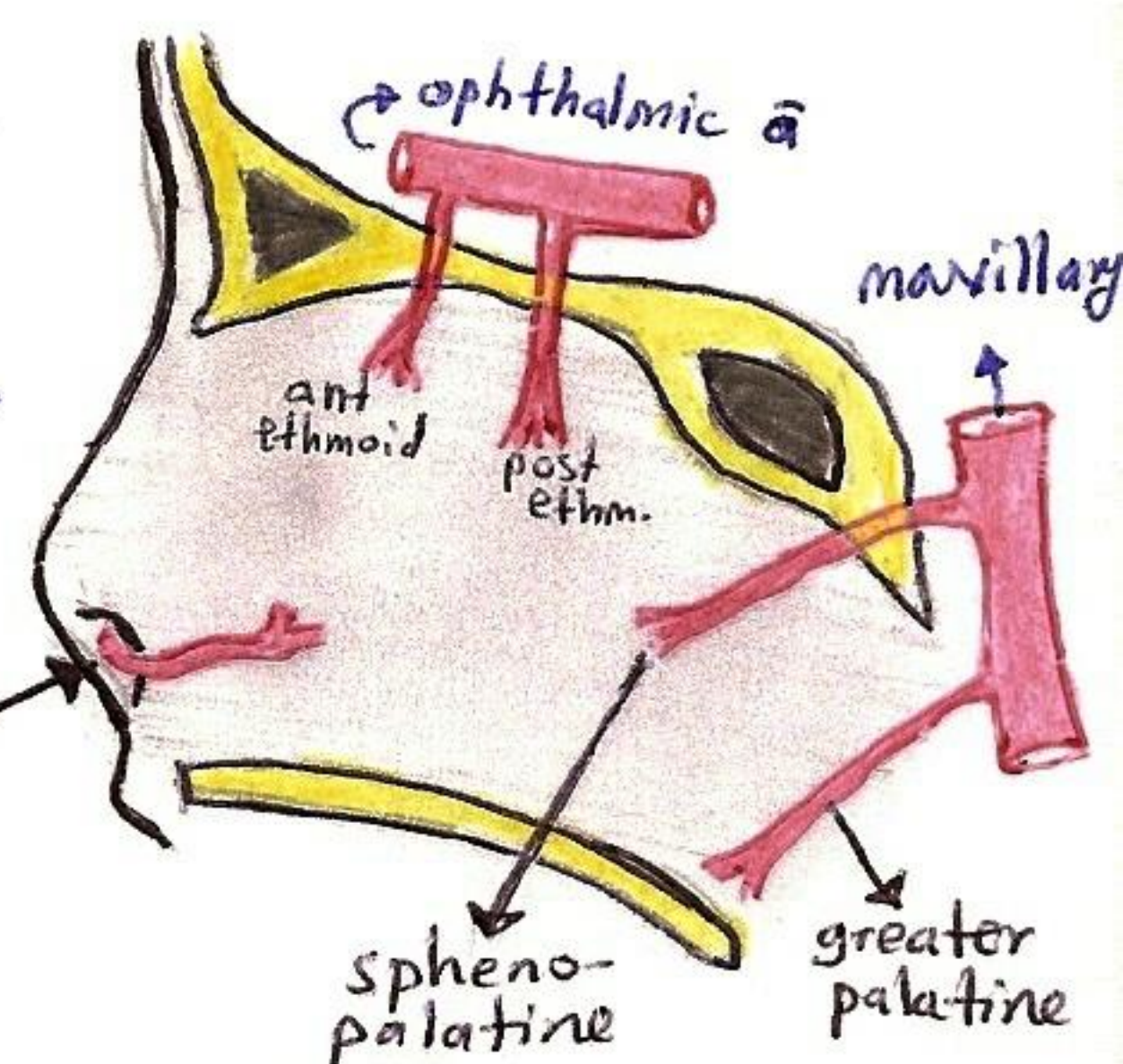
- inferior meatus** :- below inf. concha.
 - receives nasolacrimal duct opening.
- Middle meatus** :- below middle concha, consists of.
 - bulla ethmoidalis : elevation → receive middle ethmoidal air sinus.
 - hiatus semilunaris : groove below bulla → receive
 - ant. ethmoidal sinus
 - Frontal
 - maxillary sinus.
- Superior meatus** :- below superior concha,
 - receives post. ethmoidal air sinus.
- Spheno-ethmoidal recess** :- above sup. concha (below roof of skull)
 - receives sphenoidal air sinus.

*** BLOOD SUPPLY :****① Arterial supply :** by

- ant & post. ethmoidal → From ophthalmic a.
- greater palatine & sphenopalatine → maxillary a.
- Septal br. of superior labial → facial a

② Venous drainage:

- corresponds to the arteries.

*** LYMPH DRAINAGE :**

① anterior part → submandibular LN.

② Posterior part → retropharyngeal & upper deep cervical LN.

*** NERVE SUPPLY :****① Lateral wall :**

(A) Special sensation :- olfactory nerves (smell)

(B) General (trigeminal) by ① ant. ethmoidal,

② greater palatine, ③ short sphenopalatine &

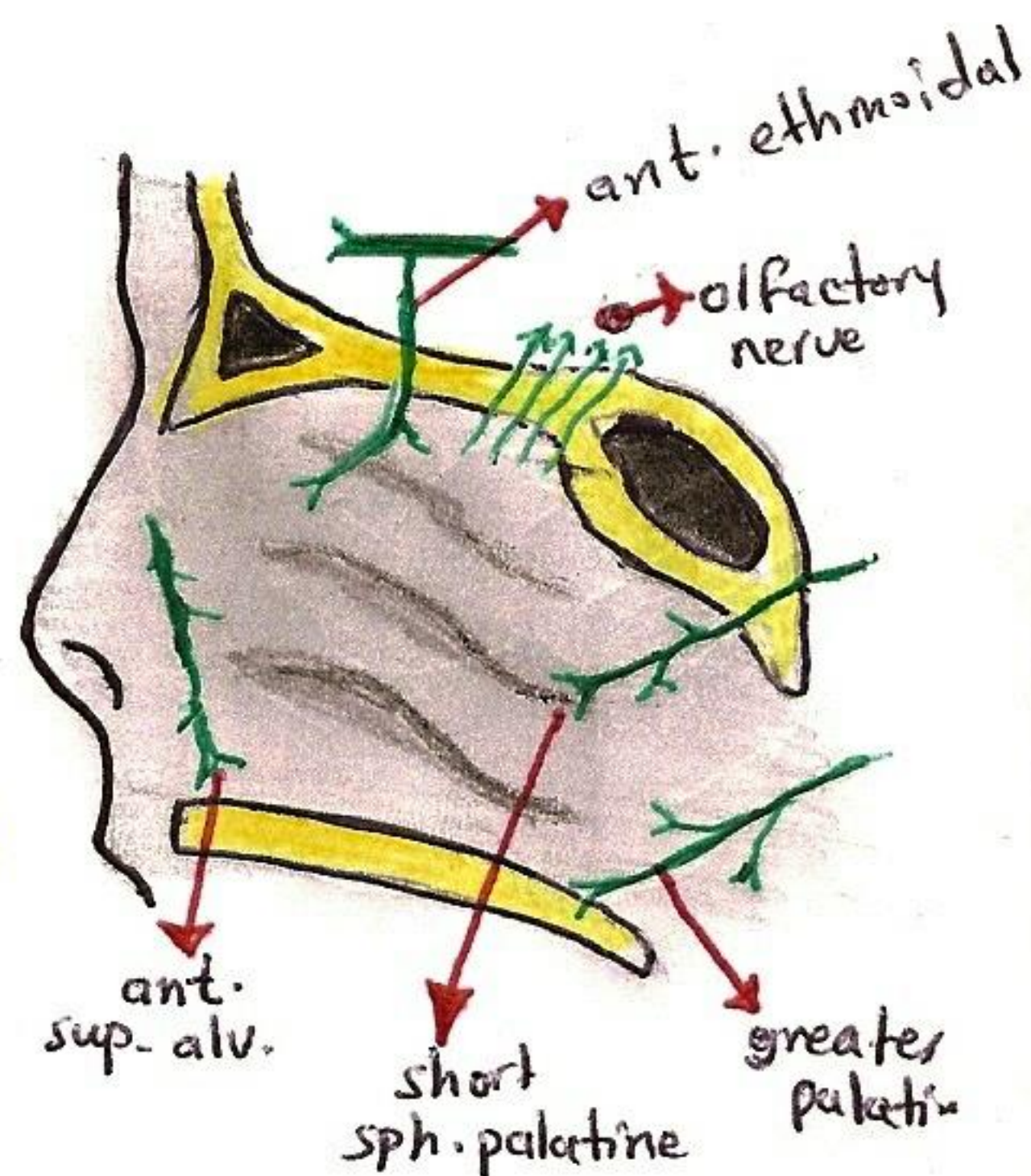
④ ant. superior alveolar nerve (infraorbital n.)

② Medial wall :

(A) special sensation (smell) :- olfactory nerve.

(B) General " (by trigeminal N.) by ① ant. ethmoidal,

② Long sphenopalatine ③ short sphenopalatine



PARA-NASAL SINUSES : are air filled spaces inside skull include

① sphenoidal air sinus ② maxillary. ③ Frontal. ④ ethmoidal (ant. middle & post).

They open in the lat. wall of nasal cavity (in meatuses)

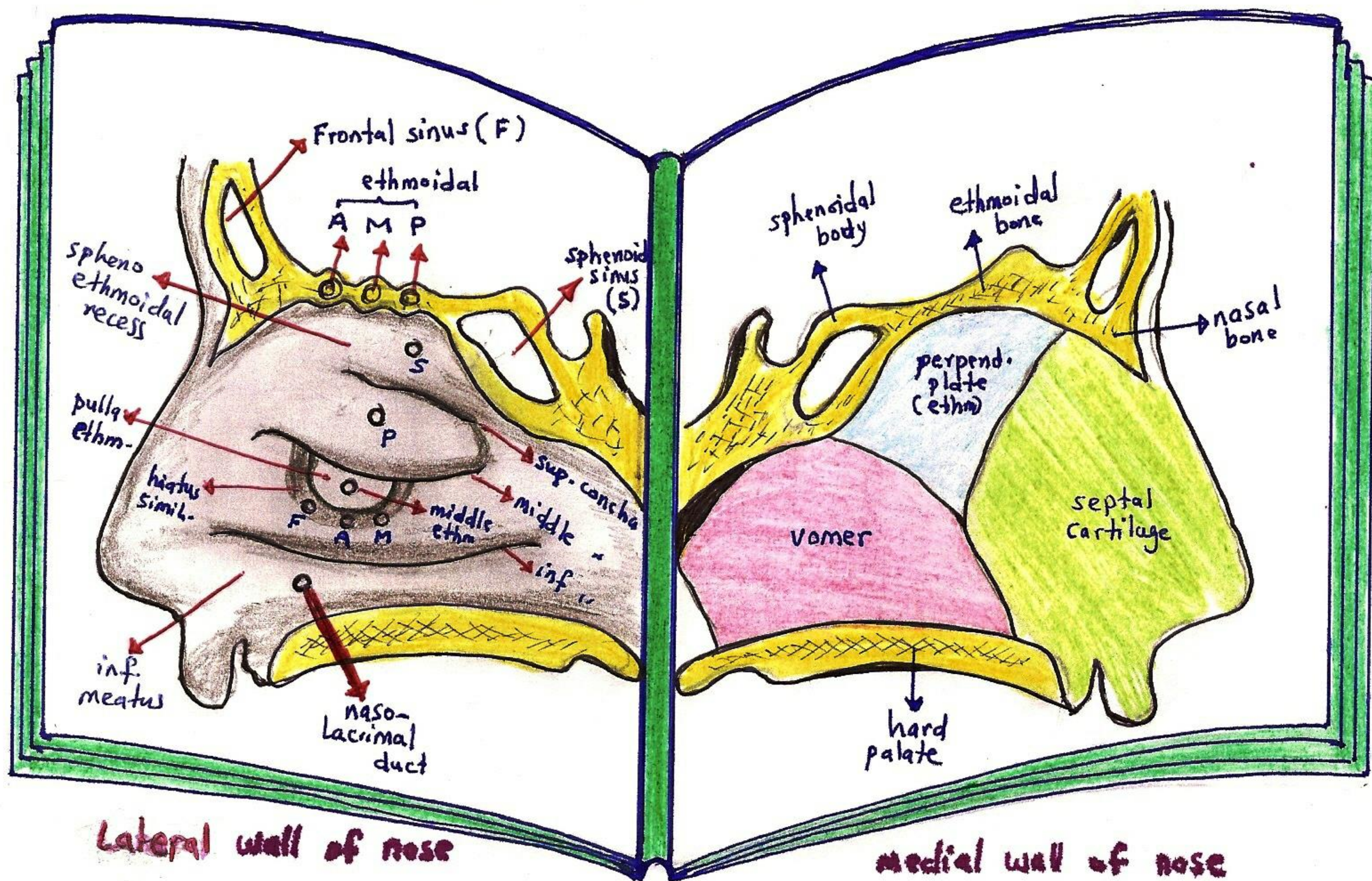
* **Function :** ① decrease skull weight

③ warm & humidify air,

② gives resonance to voice.

④ Protect brain against temp. changes.

NASAL CAVITY



- N.B -
- Superior concha is the smallest & usually fuses posteriorly with middle concha (it is usually not seen from ant. nares).
 - Superior & middle conchae are parts of ethmoidal bone.
 - Inferior concha is the largest & is a separate bone.

S/S OF NASAL DISEASE

- | | |
|--------------------|-------------------------|
| ① Epistaxis | ② Nasal discharge. |
| ③ Pain & headache | ④ Nasal obstruction. |
| ⑤ smell disorders. | ⑥ swelling. |
| ⑦ snoring. | ⑧ sleep apnea syndrome. |

I. EPISTAXIS

— It is a bleeding from the nose, mostly from the Little's or Kiesselbach's area (in the anterior part of nasal septum) which is anastomosis of :

- Anterior ethmoidal artery.
- sphenopalatine a
- superior labial a (from facial a)
- Greater palatine a.

* Causes :

- ① Idiopathic ; bleeding from Little's area, it's commonest cause. (90% of cases)
- ② Traumatic ; RTA, FB, ~~x~~ nasal bone, postoperative.
- ③ Inflammatory ; acute, chronic rhinitis.
- ④ Tumours ; benign (angio fibroma), malignant (Nasoph. carcinoma)
- ⑤ General causes :- e.g
 - CVS : hypertension, ↑ venous pressure.
 - blood disease : Purpura, haemophilia, leukemia, etc
 - Drugs : heparin, warfarin, salicylates, etc
 - fevers : Rheumatic fever, Diphtheria, ... - etc

* Management :

- 1- Patient sitting (unless shocked), head flexed & pinching nose between 2 fingers. & cold compressor
- 2- insert ~~a~~ cotton soaked with adrenaline (not used in hypertensive)
- 3- Nasal packing (ant. or post) for 24-48 hrs.
- 4- Cautery ; chemical (Trichloroacetic acid) or Electric cautery.
- 5- Surgery (if above failed or severe bleed) ; by ligation of a (e.g maxillary)
- 6- General ; bed rest, sedation, bd transfusion, vit K, antibiotic (if backing)
 - investigate pt to find the cause & treat it.

II • NASAL DISCHARGE :

	Bilateral discharge	unilat. discharge
watery	allergy, acute rhinitis, lacrimation	CSF rhinorrhoea
water + fluid	Perforated hard palate	oro-maxillary fistula
Purulent	bilat. nasal obst $\rightarrow$ stasis $\rightarrow$ infection	unilat. obst. (FB)
Bloody	see epistaxis	see epistaxis
Crusts	atrophic rhinitis	atrophic rhinitis ^{deviated septum} post surg

III • NASAL OBSTRUCTION :

* Causes "unil or Bilateral"

1. Congenital :- e.g. cong. choanal atresia (ie atresia of post. nasal opening)
2. Developmental: e.g. deviated nasal septum.
3. Traumatic: e.g. FB (foreign body) (unil)
4. Inflammatory: e.g. rhinitis & sinusitis [acute or chronic], diphtheria
5. Allergic: e.g. nasal polyps, Antrochoanal polyp (unil).
6. Tumours: e.g. benign (papilloma), malignant (ca., sarcoma).
7. Nasopharyngeal causes: e.g. adenoid, fibroma, tumours

NB: Antrochoanal polyp :- is a single unil. polyp arises from maxillary antrum $\rightarrow$ choana (post nares) $\rightarrow$ nasopharynx, common in teen-ager, causing unil. nasal obst & discharge, Dx by post rhinoscopy. & ttt: by removal (endoscopic) & antrectomy (in recurrent cases)



IV • SMELL DISORDER

- Anosmia = loss of smell
 - Hyposmia = diminution of smell
 - Cacosmia = subjective sensation of bad smell: by maxillary sinusitis, FB.
 - Parosmia = " " " a nonexisting smell by hysteria, epilepsy.
- Due to {
 intranasal: obst, atrophic rhinitis, neuritis (DM)
 intracranial: brain tumor, base

V • SLEEP APNEA SYNDROME

- sleep apnea = cessation of breathing at sleep $\geq$ 10 seconds.
- sleep apnea syndrome = repeated sleep apnea $>$ 30 times/night sleep.

EXAMINATION OF NOSE:

- * **History**:- nasal obstruction, discharge, bleeding (epistaxis), ^{loss of smell.} anosmia
- * **Examination**:- for swelling, tenderness, deviation,etc
- **Anterior rhinoscopy**:- using a nasal speculum (superior concha not visualized)
- **Posterior rhinoscopy**:- using a post-nasal mirror.
 - it can visualize the auditory tube, adenoid.
- **Others**:- sinus endoscopy, x-ray, CT, c/s of discharge, ---

FOREIGN BODY:

- foreign body in nose most common in children.
- **Rhinolith** "nasal stone": is ppt of Ca & Mg. salts from nasal secretion around the F.B.
- **C/P**:- Unilateral offensive purulent or bloody discharge & obstruction in a child is pathognomonic of F.B.
- **ttt**:- removal of F.B. and antibiotic cover.

FRacture OF NASAL BONES:

- usually caused by a blow or RTA, usually compound *.
- **C/P**:- tenderness, swelling, deformity, epistaxis, nasal obstruction
- **invest**:- x-ray.
- **ttt**:- reduction (by Walsham's forceps) if oedema reduce 1-2 wks later
 - immobilization by POP
 - if come late do rhinoplasty (refracture & reduce)



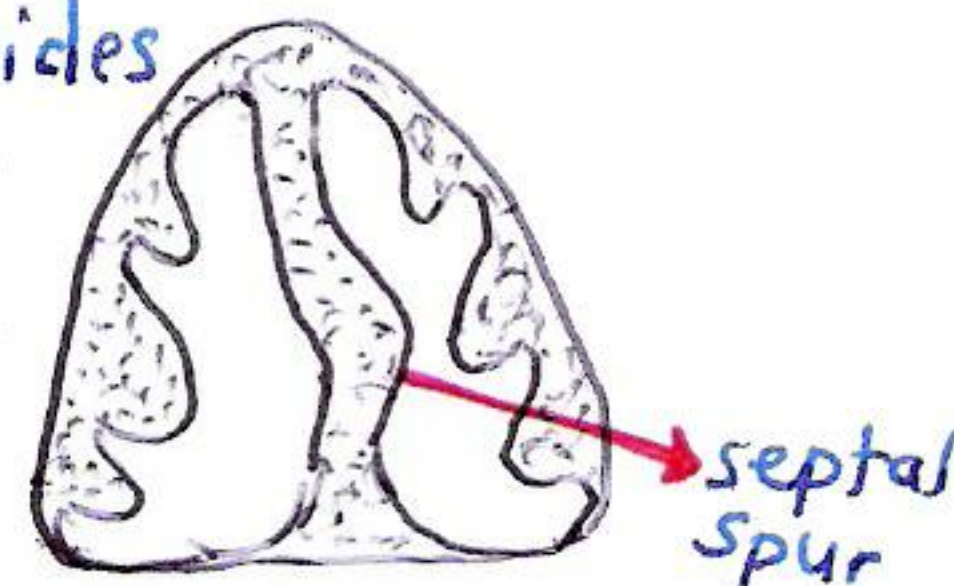
NASAL POLYPS:

- Def**:- pedunculated oedematous nasal mucosa (mostly middle meatus)
- causes**:- ① allergy (commonest) ② chr. inflamm. (ethmoiditis) ③ Mixed (1 & 2)
- C/P**:- Bilateral nasal obstruction, discharge
- ttt**:- removal of polyps (Luc's forceps) endoscopic
- ttt the cause (anti allergy, cortisone)
 - Ethmoidectomy (in recurrent cases)
- NB**:- most cases are bil., if unilateral in old age suspect malignancy.
- most cases are associated w/ bronchial asthma.

NASAL SEPTUM DIS.

DEVIATED SEPTUM :

* **Definition** : bending of septum to one or both sides may be associated $\bar{e}$ septal spur (thickened lower part). "the septum usually not perfectly straight"



* **Causes** :-

- Familial & racial.
- Traumatic.

* **Symptoms** :-

- Asymptomatic (except if it is severe)
- Nasal obstruct (unil. or Bil) $\rightarrow$ sinusitis, ...etc
- Epistaxis : due to angulation of vessels at convex side. or due to atrophic rhinitis at wider side.
- External deformity : in traumatic cases.

* **Treatment** :- Submucous resection (SMR) or septoplasty.

PERFORATED SEPTUM :

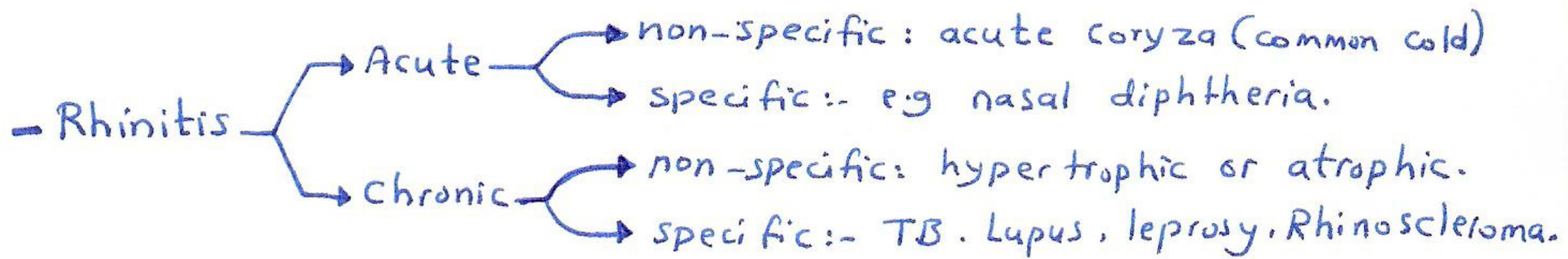
(A) **anterior perf.** : (in cartilagenous part) due to

- Traumatic :- following SMR, nose picking, Cocain addiction.
- Inflammatory :- Leprosy, septal abscess.

(B) **Posterior Perf.** : (in bony part) : usually due to syphilis.

RHINITIS

- It is inflammation of the nasal mucosa



* ACUTE CORYZA :

* **Definition:** acute infection by virus w may 2^{ry} infected by bact.
- disease spread by droplet inf & incubation period 1-3 days.

* **Predisposing causes:** low immunity, nasal diseases, irritation (smoking)

* **C/P :-**

- ① Ischemic stage: dryness & burning of back of nose & throat ^{few hrs}
- ② Hyperaemic stage: sneezing, watery discharge & obst. followed by low grade fever, malaise, congested mucosa.
- ③ stage of 2^{ry} bact. inf.: after few days → thick purulent discharge and toxemia increase.

④ stage of recovery: resolution in 3-7 days

* **complication:** sinusitis, otitis media, descending (pharyngitis,etc)

* **Treatment:** rest, ↑ fluid intake, analgesia, vit C, antihistamine, antibiotic (if 2^{ry} inf.), nasal drops (argyol ephedrine)

* ATROPHIC RHINITIS (OZAENA)

- Chronic rhinitis = atrophy of mucosa & conchae of nose
- signs: roomy nose, greenish or black crusts

* RHINOSCLEROMA :

- chr. specific inflam. due to bacillus rhinoscleromatic,
- stages are: atrophic, then hypertrophic then fibrotic stage
- Biopsy: shows
 - Miculicz cells: large foam cell contain bacilli
 - Russell bodies: bright red degenerated plasma cells.
- ttt: AB (streptomycin 1g daily for 40 days).

SINUSITIS

• The commonest sinus to be involved is: maxillary sinus b/c:

1- It is the largest sinus.

2- Unproper drainage

3- Dental source of infection

• The sinusitis may be ——— acute (viral, bacterial)
chronic (specific, nonspecific).

ACUTE SINUSITIS:

* Definition:- acute infection of one or more sinuses by pyogenic bact

* Etiology:-

- Nasal:- (80%):- acute rhinitis, swimming, FB, packing.
- Dental:- (10%):- infection, post extraction (molar teeth)
- Traumatic:- (10%):- e.g. involving sinuses (compound)

* predisposing factors:-

- General:- low resistance & immunity, malnutrition, ...
- Local:- Nasal obst, deviated septum, allergic polyp, ...

* Symptoms:-

- Fever, headach, malaise, anorexia

• the headach ↑ by bending, straining or coughing.

• nasal discharg: purulent, foetid (if cause is dental)

• Pain at site of sinus, in maxillary sinusitis refer to teeth or ear

* Signs:- → • Tenderness, oedema of nasal mucosa, redness.

* investigation:- Transillumination, Plain x-ray (opacity or fluid level)

• Rhinoscopy, CBC, ESR, C/S of discharge.

* Treatment:- • bed rest, antibiotic, analgesia, antipyretic, antihistamine

• Local decongestant drops,

• Puncture Lavage if no response & drain pus.

* Pathology:- acute catarrhal & suppurative.

CHRONIC SINUSITIS

- * **Etiology**:- improper Rx, high virulence of bacteria, low resistance of pt or existing predisposing cause.
- * **Pathology**:- hypertrophic, atrophic.
- * **Symp./signs**:- Like acute with acute on top of chronic.
- * **investigation**: transill., x-ray, CT scan, rhinoscope, c/s, ... etc
- * **Treatment**:-
 - Treat underlying cause
 - AB, decongestion, analgesia, ... etc
 - Surgical treatment depends at sinus:-
 - in maxillary sinusitis:-
 - 1- antral puncture & Lavage (repeated 3, 4 times)
 - 2- intranasal antrostomy [new opening under inferior concha (turbinate) to improve drainage]
 - 3- Radical antrostomy (Caldwell-Luc operation)
 - 4- Endoscopic sinus surgery (ESS) now a days.

COMPLICATION OF SINUSITIS :

- (A) **Cranial**:- osteomyelitis → subperiosteal abscess → fistula.
- (B) **Intracranial**:-
 - ① - meningitis
 - ② - Extradural abscess
 - ③ - Brain abscess
 - ④ - Cavernous sinus thrombosis.
- (C) **Orbital**:- → orbital cellulitis, optic nerve atrophy, abscess.
- (D) **Descending infection** → otitis media, pharyngitis, GIT disturbance.
- (E) **General** → septicemia, pyemia.

NB: Ethmoidal sinusitis is usually ass. w/ other sinusitis
 - more common in children, pain felt b/w 2 eyes.
 - Rxed by AB, decongestion, ethmoidectomy.

LARYNX

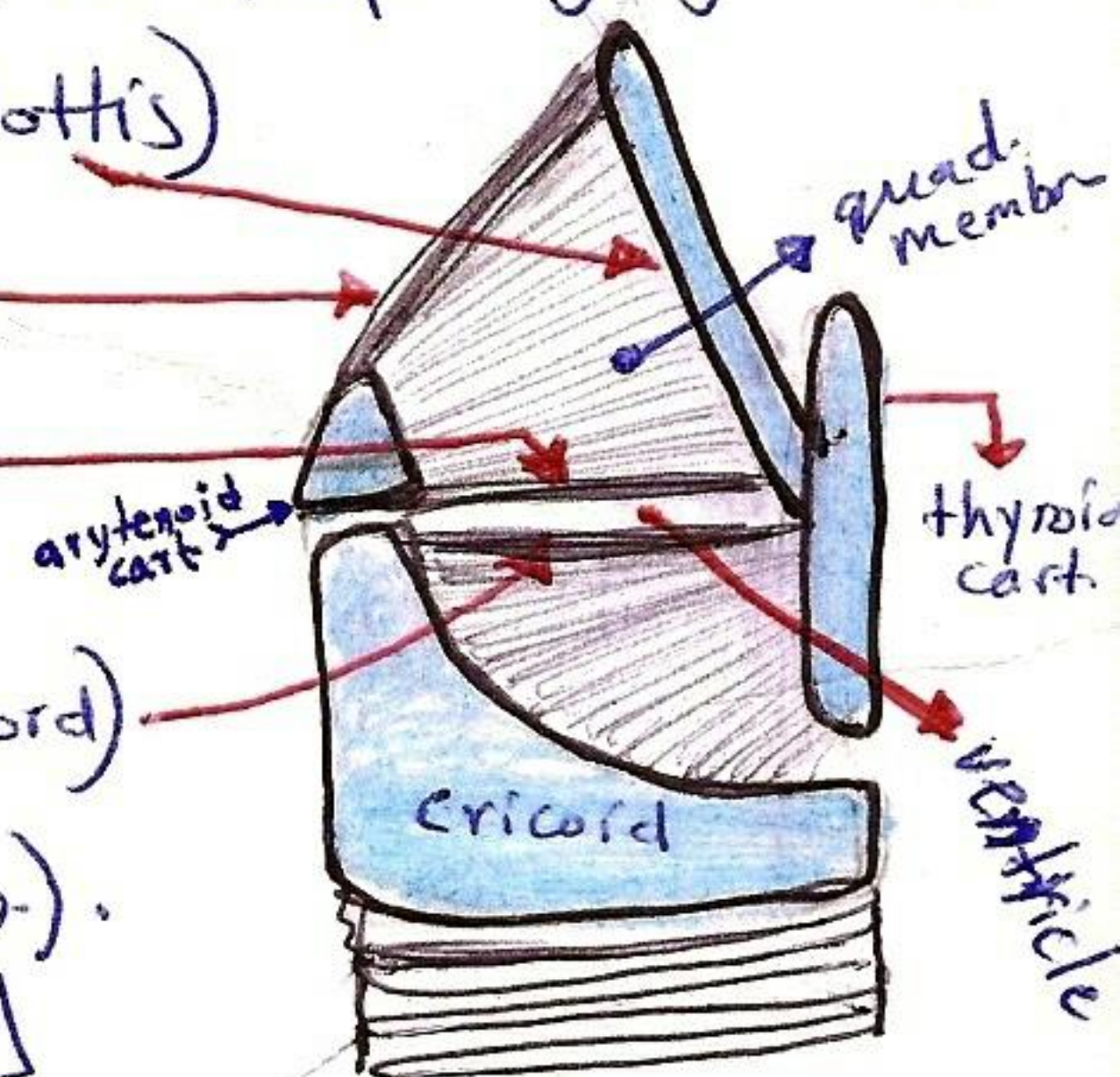
- It is a tube formed mainly by cartilage extends from epiglottis to trachea (C6 vertebra) acting as air passage & voice organ.
- It consists of ① cartilages, connected by ② ligaments & membranes and lined by ③ mucosa & moved by ④ muscles.

* CARTILAGE OF LARYNX: (single or paired).

- | | | | |
|-----------------|----------|---------------|-----------|
| ① Epiglottis. | } single | ④ arytenoid | } paired. |
| ② Thyroid cart. | | ⑤ Corniculate | |
| ③ Cricoid cart. | | ⑥ Cuneiform | |

* LIGAMENT & MEMBRANES:

- ① Thyro-hyoid membr. (pierced by int. laryngeal n. & sup. laryngeal a).
- ② Quadrate membr. (bet. arytenoid cart. & epiglottis)
 - it's upper border → ary-epiglottic fold
 - it's lower border → vestibular fold (false cord)
- ③ Crico-thyroid membr. & Lig.
 - it's upper border → vocal lig. (true vocal cord)
 - (vocal cord = vocal lig covered by mucous memb.).
 - [between vocal & vestibular folds called ventricle]



* LYMPH. DRAINAGE OF LARYNX:

- the vocal cord & above → upper deep cervical LN.
- Below vocal cords → lower deep cervical LN.

NB - below vocal cord → called infraglottic compartment (above → supra-)
 NB - above vestibular fold → called vestibule.

* BLOOD SUPPLY OF LARYNX:

- ① - Superior laryngeal a (br. of sup. thyroid a).
 - ② - inferior ~ ~ (~ ~ inf. ~ ~).
- the veins corresponds to arteries.

* NERVE SUPPLY:

- [A] MOTOR: all ms. of larynx are supplied by recurrent laryngeal n. (except crico-thyroid → by external laryngeal n.).
- [B] SENSORY: mucosa above vocal cord → by internal laryngeal n.
 - mucosa below ~ ~ → by recurrent ~ ~.
- N.B. - recurrent laryngeal is br. of vagus (also called int. laryngeal)
 - int. & ext. ~ ~ - superior laryngeal (br. of vagus)

* MUSCLES OF LARYNX:

- [A] Muscles closing laryngeal orifice:
 (transverse arytenoid & two ary-epiglottic ms).
- [B] Muscles stretching vocal cords:-
 (two crico-thyroids & two post. crico-arytenoids).
- [C] Muscles relaxing vocal cords:-
 (two thyro-arytenoids).
- [D] Muscles abducting vocal cords:-
 (two post. crico-arytenoids).
- [E] Muscles adducting vocal cords:-
 (1 transverse arytenoid & two lat. crico-arytenoids).

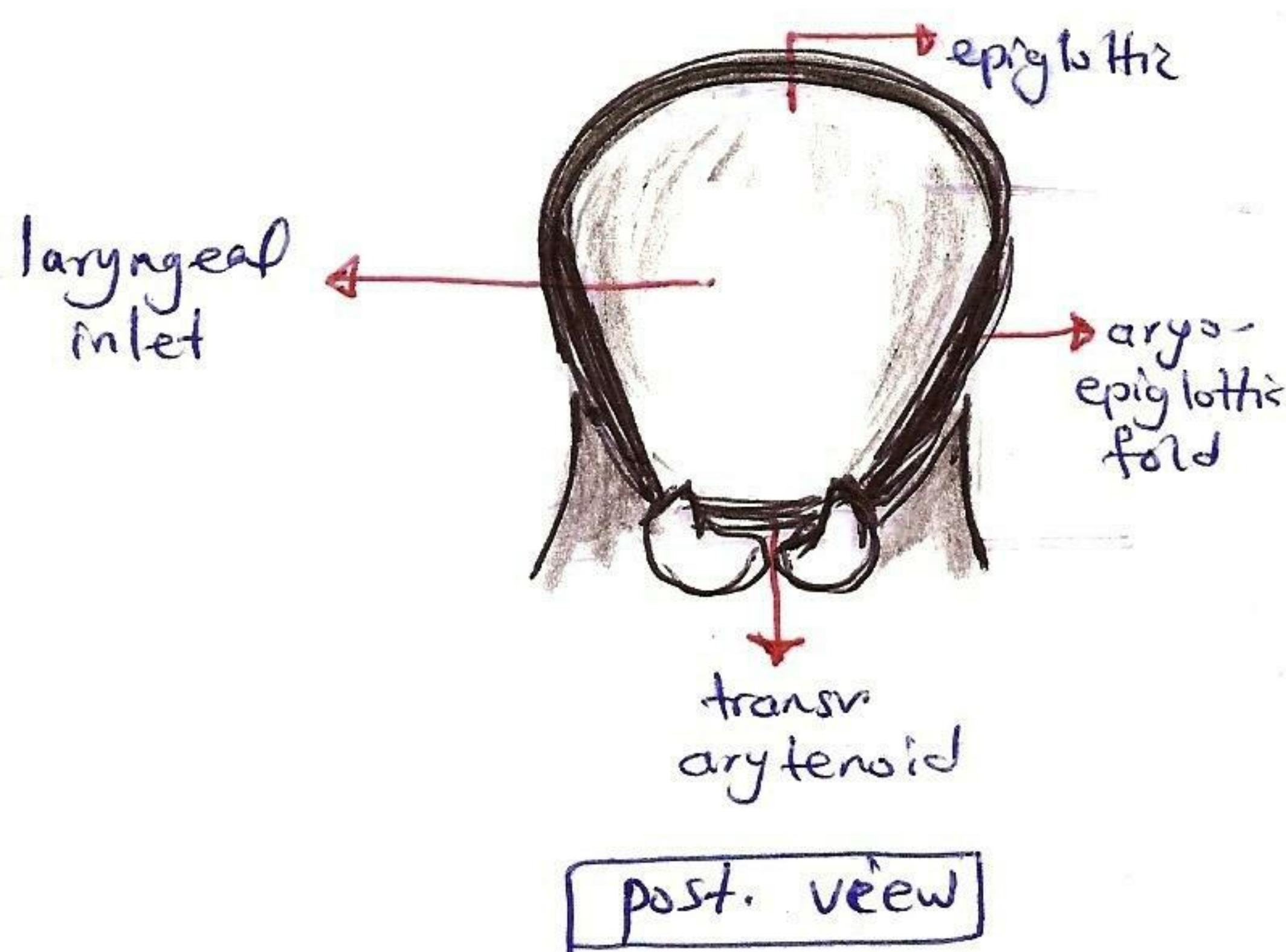
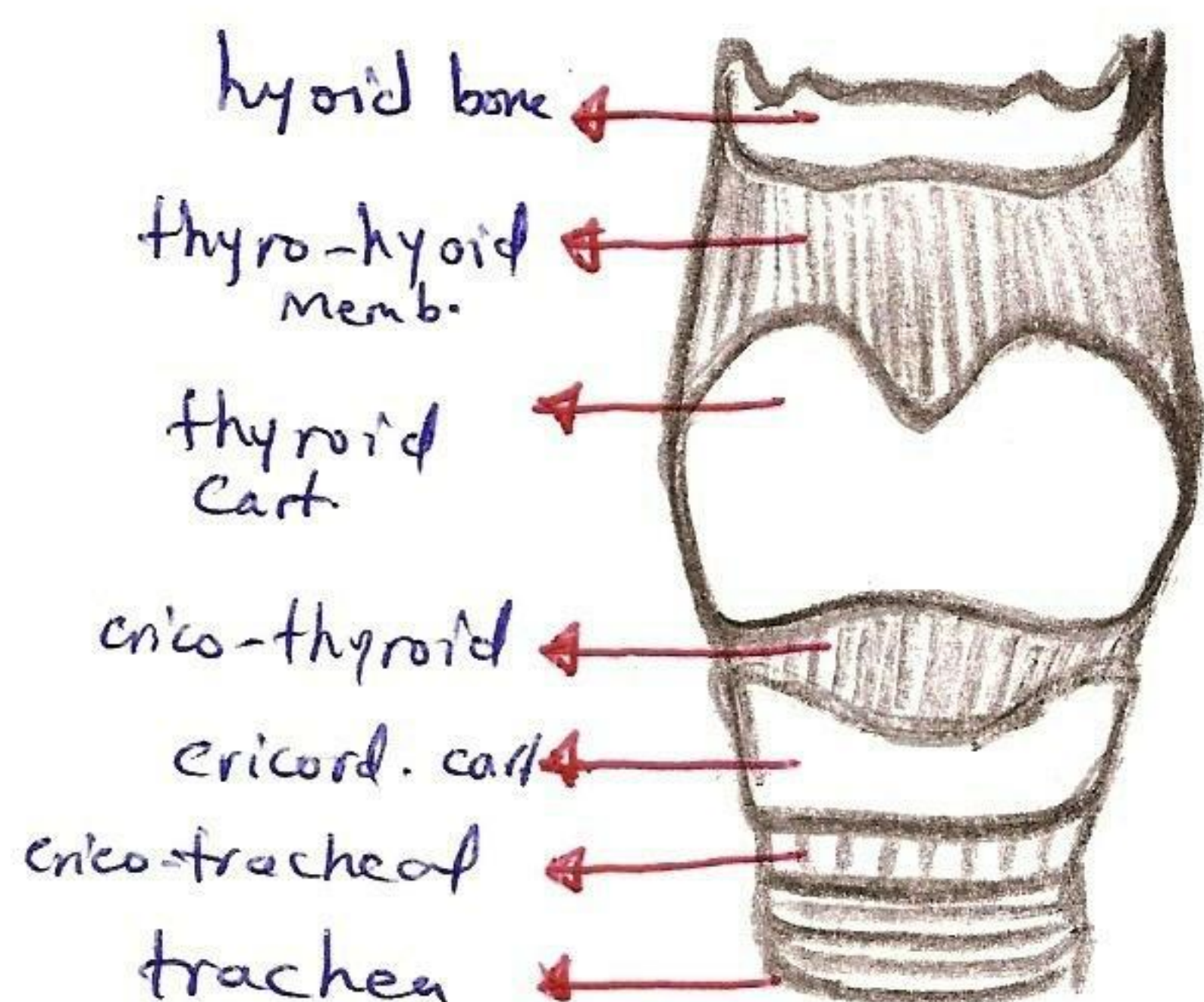
NB * all ms of larynx are intrinsic (origin & insertion in larynx).
 * all ms of larynx present inside larynx (except cricothyroid lies outside).

* LARYNGEAL INLET (ORIFICE):

- anteriorly & above → epiglottis.
- each sides → aryo-epiglottic fold (contain aryo-epiglottic ms).
- inferiorly & behind → inter-arytenoid fold (contain transv. arytenoid ms)

NB. Rima glottidis → space between 2 vocal folds (narrowest part)

Rima vestibuli → space between 2 vestibular folds.



NB- Vibration in vocal cord in male → 165 H/sec
in female → 250 H/sec

- Cricoid is the only complete ring in respiratory tract
- hyaline cartilage becomes calcified by age
- Epiglottis is fibroelastic cartilage, does not calcify by age

S/S OF LARYNX DIS.

- | | |
|------------------------|--------------|
| ① Stridor | ④ Pain. |
| ② Hoarseness | ⑤ Dysphagia. |
| ③ Cough, expectoration | ⑥ Choking |

→ **Biphasic stridor : disease of tracheobronchial & distal**

(I) * STRIDOR

*** Definition :** Noisy difficult breathing due to partial obstruction of airways.

(complete obst → choking → asphyxia → cyanosis → coma → death).

*** Types:-** ① inspiratory stridor : (Laryngeal obst.)
② Expiratory stridor : (bronchial obst.) e.g asthma, FB.

*** Causes:-** ① Congenital :- e.g cong. web, stenosis, laryngomalacia.
② inflammatory :- acute & chronic laryngitis, diphtheria, ^{acute} epiglottitis
③ Allergic: Laryngeal oedema e.g by drugs (Penicillin, iodides)
④ Neuromuscular : bilateral abductor paralysis.
⑤ Neoplastic ; Benign (Papilloma) or malignant (carcinoma).
⑥ cyst. , after radiotherapy, FB.
⑦ Extralaryngeal causes :-
• congenital → cystic hygroma, vascular ring, goitre, ... etc
• Acquired → retropharyngeal abscess, lymphadenopathy.

■ common causes in children :- laryngitis, diphtheria, FB.

*** Treatment:-** (according to severity):-

- conservative ; IV Fluid, humidified O₂.
- Antibiotic, Antihistamin, Steroids (↓ oedema)
- Treat underlying cause, observe vital signs, do ABG, ... etc
- Endotracheal intubation.
- Tracheostomy [if sever, or if mechanical obst.]

NB:- if Endotracheal intubation continue for > 2wk. remove & do tracheostomy.

(II)

HOARSENESS

* definition: - sound quality disturbance.

* Causes: - any laryngeal disease can cause hoarseness.

① Congenital ; e.g. cong. web (membrane).

② inflammatory ; acute & ch. laryngitis.

③ trauma , FB .

④ recurrent laryngeal N. palsy.

⑤ Extralaryngeal : e.g. mediastinal mass.

• In children commonest causes are:

- Laryngitis , cong. web , multiple papillomata.

EXAMINATION OF LARYNX

①:- Indirect laryngoscopy:- using laryngeal mirror.

② Direct " " :- " laryngoscope.

③ Flexible fibroptic laryngoscopy: introduced through nose.

④ CXR, CT scan, ---- etc

NB:- Direct laryngoscopy is indicated in:-

- = examination of larynx , visualize vocal cord , FB .
- = insertion of endotracheal tube.
- = therapeutic :- remove FB , remove polyp , ~~etc~~
- = Biopsy taking.

DISEASES OF LARYNX

* LARYNGOMALACIA "cong. Laryngeal stridor"

- It is a cong. stridor due to abnormally soft Laryn. tissue
- Stridor is noted soon after birth.
- ttt: • no ttt needed (stridor usually disappear at 2nd year)
 - Tracheostomy rarely needed

M:F = 2:1

* INFLAMMATION:

- Acute
 - Non-specific
 - specific (diphtheria)
- Chronic
 - Non-specific
 - specific (TB. & scleroma).

... Diphtheria :-

- usually 2nd to pharyngeal diphtheria, the greyish-white diphtheritic membrane extends to larynx → stridor.
- ttt: - rest, - isolation, antitoxic serum + penicillin large doses.
 - Tracheostomy may be needed.

* SINGER'S NODES :-

- A small nodule at one or both vocal cords due to excessive use of voice (organized hematoma) "in actors, singers, teachers"
- usually at junction of ant & middle 1/3 of cord & bilateral
- ttt: removal by microlaryngoscopy (CO₂ laser or instruments)

* LEUCOPLAKIA

- hyperplasia of epith. of vocal cord & hyperkeratosis.
- c/p :- hoarseness. by laryngoscope → white raised patches
- ttt: removal & follow up pt ⇒ Precancerous lesion

TUMOURS OF LARYNX :

- BENIGN: - epithelial: Papilloma (commonst)
- C.T: - angioma, chondroma, etc.
- Malignant: Carcinoma.

A * PAPILLOMA

- A warty epith. tumour is a vascular C.T, may be ^{single} multiple

	Single papilloma	multiple papilloma
incidence	adult more	children
symptoms	Hoarseness	stridor, hoarsness.
signs	affect vocal cord	affect any part of larynx
recurrence	not recurrent	recur but regress after puberty.
malignant change	not precancerous	not precancerous

B * Carcinoma

85 % sq.cc 15% adenoca

- It is common in male, old (>40 yr)
- pathology: - 80% sq. cell ca. (in vocal cord)
- classified into supglottic, glottic & supraglottic
- C/P: - hoarsness (1st symptom in glottic), throat discomfort (1st symptom in supraglottic), stridor (Late), Pain (Late)
- s/s of malignancy (wt loss, A.A.A), s/s of metastasis.
- invest: x-ray, CT scan, biopsy, laryngoscopy.
- ttt: - operable: - Laryngectomy (localized (vocal cord) or total) + LN clean
(irradiation gives same result in early cases)
- In operable: Tracheostomy, Gastrostomy, palliative, etc
- predisposing (premalig). conditions: ttt -- Radiotherapy with T1

TNM staging :

- T1: one region + mobile vocal cord
- T2: tow adjacent regions + mobile cord
- T3: endolaryngeal + fixed cord
- T4: outside larynx
- N1: single, ipsilateral LN < 3cm
- N2: single (>6cm) or multiple ipsilateral
- N3: bilateral >6cm
- M1: distant metastasis

TRACHEOSTOMY

* **Definition:** Artificial opening of cervical trachea.

- * **Types:**
- ① High - bet. 1st. 2nd tracheal rings (above thyroid isthmus)
- Disadv.: larynx stenosis (Perichondritis → necrosis → fibrosis)
 - ② Mid - bet 3rd. 4th rings → operation of choice.
 - ③ Low - bet 5th. 6th rings (below thyroid isthmus).
- Disadv.: - surgical emphysema, deep trachea.
- injury to innominate vein (high in child & ♀)
- tube slips easily.

* **Indication:** - the tracheostomy is indicated if.

- ① Upper resp. obstruction (web, malacia, FB, diphtheria, tumor, ... etc)
- ② Lower " " :- by secretion in case of
 - Prolonged coma (traumatic, CVA, tumour)
 - Paralysis of resp. muscle (polio, Diphtheria, Myasthenia Gr.).
 - Sever chest injury : e.g flail chest, post op, ... etc.
- ③ Prophylactic (no obst) :- surgery of mouth, pharynx, ... etc

* **Anaesthesia:** - no anaesthesia in urgent cases.

* **Complication:**

- ① - Shock (intraoperative by hemorrhage, anaphylactic from local anest)
- ② - Haemorrhage: (1st. 2nd or reactionary).
- ③ - early post op. :- apnea, pneumothorax, emphysema.
- ④ - Lat post op - stenosis, tracheo esoph. fistula -
- ⑤ - Slipping of tube → resp. obst
- ⑥ - infection (wound or pulm. infection).
- ⑦ - Difficult extubation: by stenosis,
- ⑧ - Tracheal fistula after removing the tube.

* **CONTRAINDICATION:** ⇒ NO CONTRAINDICATION.

LARYNGOSTOMY:

- surgical opening in cricothyroid membrane
- indicated only in real emergency if can't find facilities.

PHARYNX

* **DEFINITION:** - It is a funnel shaped muscular tube, starts from base of skull, ends at C₆ vertebra (becomes esoph.)

* **STRUCTURE:**

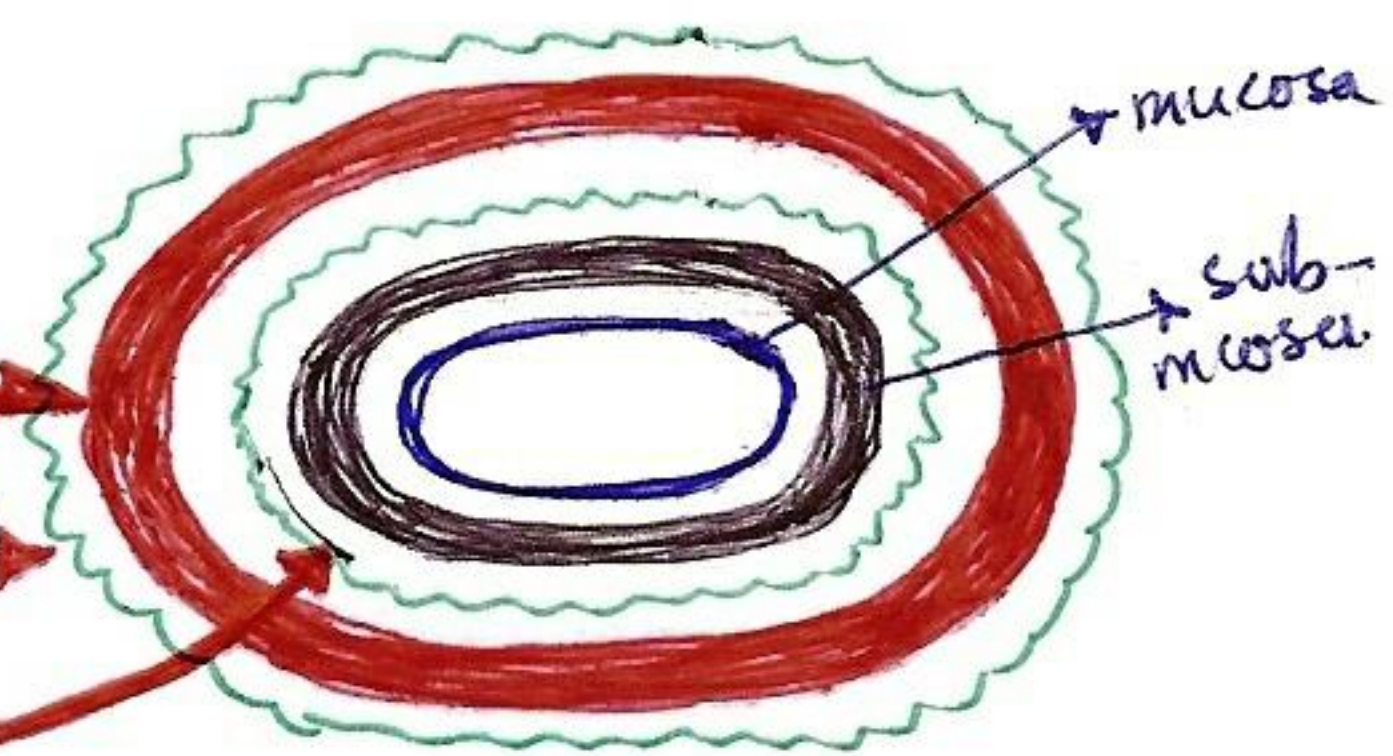
① Mucosa.

② Submucosa.

③ Pharyngo-basilar fascia

④ Pharyngeal ms.

⑤ bucco-pharyngeal fascia



* **PHARYNGEAL MUSCLES:**

[A] Transverse : 3 constrictors (superior, middle & inferior).

[B] Longitudinal : 3 pharyngeus (stylo-, Palato-, & Salpingo-pharyngeus).

* **NERVE SUPPLY:**

- ALL muscles of pharynx are supplied by pharyngeal plexus of nerves except Stylo-pharyngeus by glossopharyngeal N.

- The plexus lies on outer surface of middle constrictor.

- [N.B.] Pharyn. plexus of n. are formed by :

pharyngeal branches of

- Glossopharyngeal n. (sensory).
- Vagus n. (motor & parasymp.).
- sup. cervical ganglion (symp. & cranial part of accessory N.

* **LYMPH. DRAINAGE:**

- Into retro-pharyngeal & deep cervical L.N.

*** ARTERIAL SUPPLY :**

- 1 - Ascending pharyngeal br. of ECA.
- 2 - Ascending palatine & tonsillar br. of facial a.
- 3 - Pharyngeal brs. of superior & inferior thyroid a.

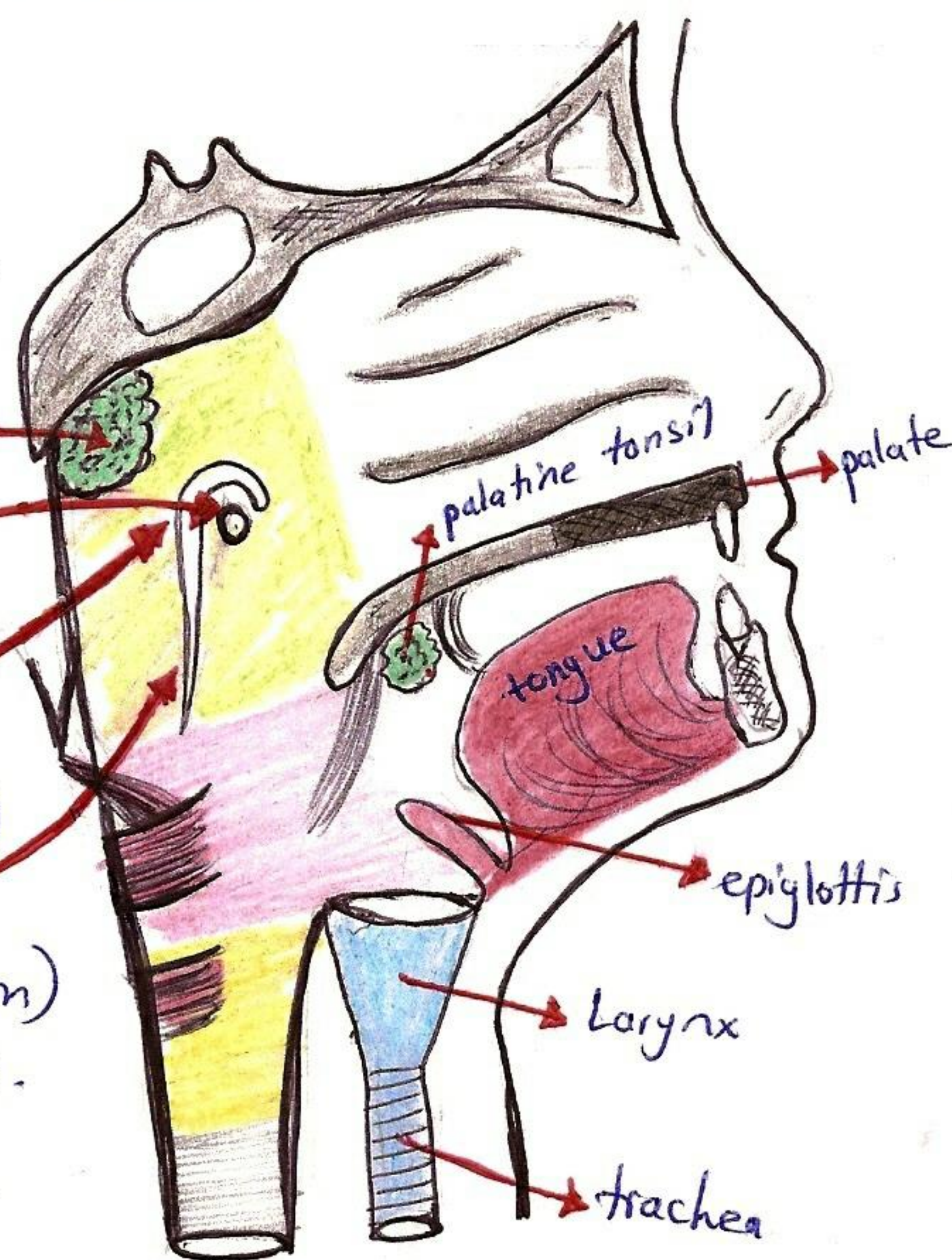
*** VENOUS DRAINAGE :**

- into Pharyngeal plexus of veins → facial & IJV.

CAVITY OF PHARYNX**(I): NASO-PHARYNX :**

- Lies behind the nasal cavity & it shows the following

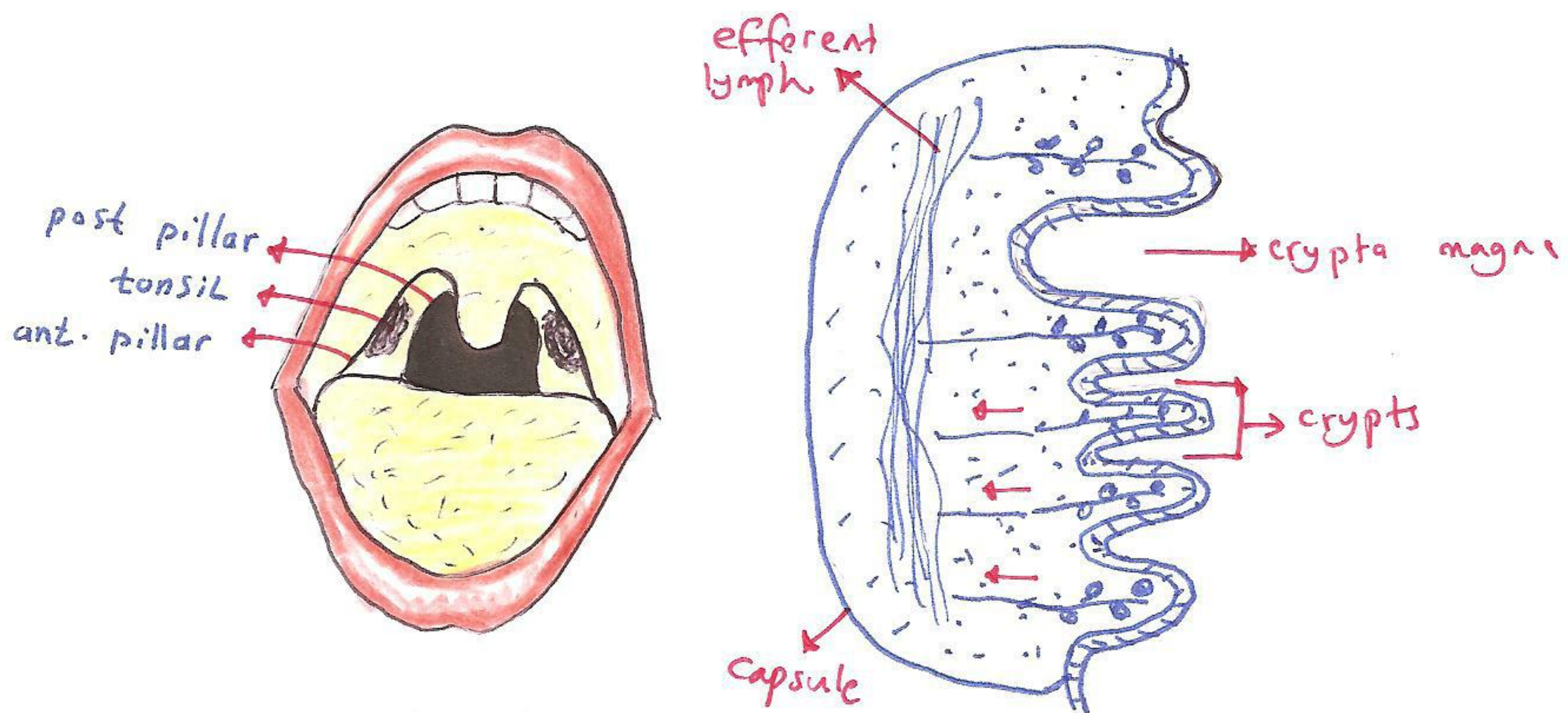
- ① - Nasopharyngeal tonsil.
- ② - Opening of Eustachian tube.
(at level of inferior concha)
- ③ - Tubal elevation
(upper & post. lips of the opening)
- ④ - Salpingo-pharyngeal fold
(the lower part of tubal elevation)
- caused by salpingopharyngeus ms.
- ⑤ - Pharyngeal recess - behind the salpingo-pharyngeal fold.

**(II): ORO-PHARYNX :**

- Lies behind the oral cavity.
- having the palatine tonsils (together with ↑ nasoph. tonsils forming Waldeyer's ring)
- Palatine tonsils lies bet. Palatoglossal fold (ant) & Palato-pharyngeal fold (Post).

Lingual tonsil & the

- The lateral surface of tonsil is covered by the a fibrous capsule separating it from its muscular bed (formed by superior constrictor ms) the space bet capsule & bed called Peritonsillar space.
- The medial wall of tonsil covered by stratified sq. epith which dips down into the body of tonsil forming 12-15 pits or crypts; the largest crypt lies just below upper pole (crypta magna)



(III) LARYNGEO-PHARYNX :

- Lies behind laryngeal cavity.
- Contains fossa on either sides called "Piriformis fossa"

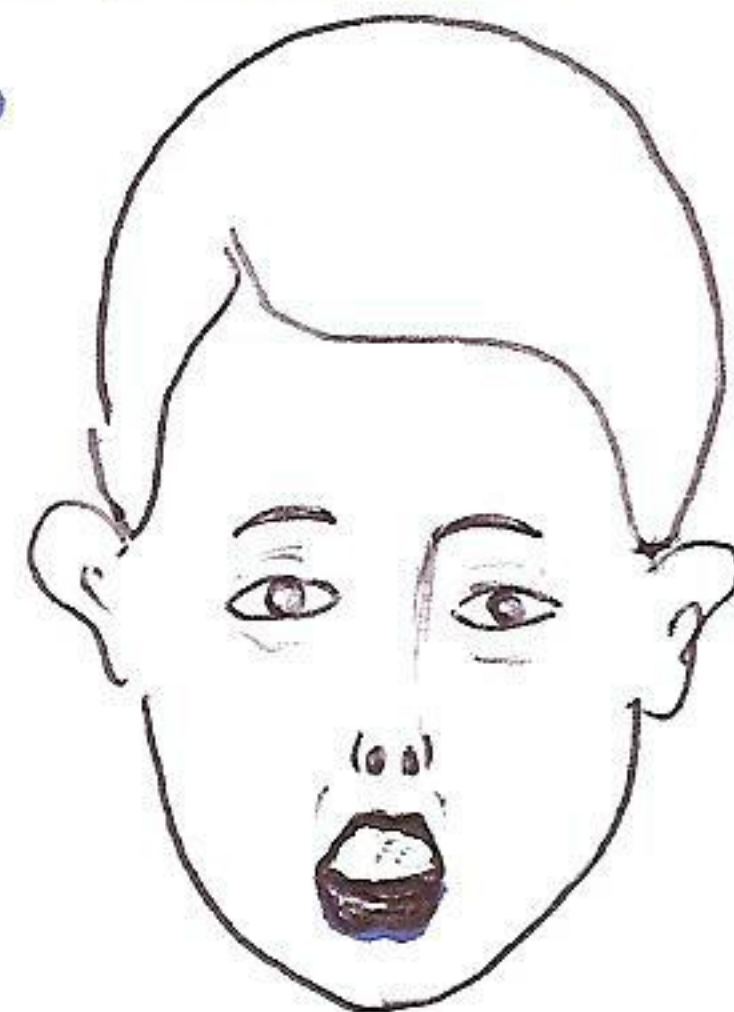
DISEASE OF NASOPH.

ADENOIDS

* **Definition:** hypertrophy of subepith. lymphoid tissue [in the roof of nasopharynx] sufficient to produce symptoms.
- it usually occurs in children, adenoid usually has no capsule.

* **Symptoms:** ~~these~~ may be:-

- ① Nasal symptoms:- nasal obstruction, discharge, snoring, mouth breathing, difficulty in suckling in infants
- ② Ear ^(aural) symptoms:- eustachian obst → recurrent acute O.M and chr. O.M, conductive deafness.
- ③ GIT symptoms:- diarrhoea, gastroenteritis (swallowed pus).
- ④ Thoracic -:- flat or pigeon chest & repeated resp. infection
- ⑤ General:- Adenoid facies:- with open mouth, narrow pinched anterior nares, elevated small upper lip, hypertrophied lower lip, crowding upper incisors, receding lower jaw & idiot look
- ⑥ Sleep apnoea syndrome.
- ⑦ Mental dullness:- due to CD, day time sleeping (by interruption of night sleep) in school



* **Diagnosis:-**

- Examination:- by post rhinoscopy. & ant rhinoscopy.
- Lat. skull x-ray (soft tissue shadow)

* **Treatment:-**

- = Adenoidectomy if marked symptoms (as mouth breath ^{aural symp.})
- = if adenitis present (AB, analgesia ... etc)

NASOPHARYNGEAL FIBROMA

*definition:- a very vascular fibroma (angiofibroma) arising from periosteum of nasoph. roof.

= It start at puberty (10-20 yr) ^{male} rare in adult

*symptoms:-

①- Nasal: nasal obst, epistaxis (sever & recurrent) ? fatal

②- Ear (aural) :- conductive deafness (CD) . No Discharge

* Diagnosis:- ant. & post. rhinoscopy.

* Treatment:- surgical excision. or radiological deep x-ray

NASOPH. CARCINOMA

- most common tumour of nasoph. (25-30 yr) ^{never in black} ♂ > ♀ 3:1

* symptoms:- nasal obst., discharge & epistaxis

- s/s of malignancy. & of metastasis

- Aural: deafness. earache + immobiliz. of palate at tumour side "Trotter's triad (diagnostic)

- may pt only presented by cervical LN [silent tumor]

* investigation:- Ant. & post. rhinoscopy. , x-ray . Nasopharyngoscopy

- Dx of metastasis . CT. MRI, ult. etc

- biopsy under GA "diagnostic"

* treatment:- Deep x-ray (radiotherapy) no surgery.

DIS. OF OROPHARYNX

(38)

TONSILLITIS

(A) * ACUTE TONSILLITIS :

* **Definition** :- Acute inflamm. of tonsils by droplet infection & commonly in children.

* **Etiology** :- usually by strept. haemolytics.

* **Symptoms** :- sore throat & dysphagia of rapid onset.

* **signs (& stages)** :-

- Catarrhal tonsillitis → diffuse congestion.
 - Follicular tonsillitis → yellowish exudate in crypts → spotted appearance which may coalesce → non adherent membrane
 - Parenchymatous tonsillitis → marked generalized redness & swelling
- = also there is cervical LN enlargement

* **Differential diagnosis** :-

- 1 - Acute pharyngitis
- 3 - Vincent's angina

- 2 - Fungal infection.
- 4 - HIV, malignancy
- 5 - Diphtheria.

* **treatment** :-

- 1 - General :- bed rest, fluid intake, vit C, antibiotic, analgesic
- 2 - Local :- warm gargles, warm soft diet. - -

(B) * CHRONIC TONSILLITIS

= Usually following repeated acute Tonsillitis, may be atrophic or hypertrophic types. ↳ (> 3 times/year)

▷ It represents a focal sepsis

▷ c/o :- mild sore throat, discomfort, O/E: irregular hypertrophied tonsils may pus come out by squeeze

▷ treated by tonsillectomy.

* **Complication** :- locally ⇒ retropharyngeal abscess, Peritonsillar abscess ^{'Quinzy'}
General ⇒ Rheumatic heart dis, glomerulonephritis

* PHARYNGITIS

- * Classification: **I** - ACUTE
- specific : Diphtheria, Vincent's angina & Moniliasis
 - Non-specific
- II** - CHRONIC
- specific: TB, S. scleroma, Lupus.
 - Non-specific.

(A) Diphtheria

- * Infection by diphtheria bacilli (*Corynebacterium diphtheriae*), affecting usually pharynx especially tonsils, may → larynx, nose.
- * Transmitted usually by droplet infection, more in children bet. 2-5 yr, incubation period 2-5 days.
- * Symptoms: sore throat, severe toxæmia, malaise, moderate fever.
- * Signs:
 - false membrane (Pseudomembrane), greyish-yellow over tonsils may extend to larynx.
 - severe toxæmia, enlarged tender cervical glands.
- * Investigations: - swab from membrane (examine for diphtheria).
- * D/D:
 - ① Acute follicular tonsillitis
 - ② Vincent angina
 - ③ Moniliasis.
 - ④ Blood diseases. (IMN, leuka)

	Diphtheria	Acute. Foll. tonsillitis
Onset & toxæmia	gradual + marked toxæmia	rapid, moderate Tox.
Signs	- rapid pulse, moderate temp. pale face, unil. LN	rapid pulse, high temp flushed face, Bil LN.
membrane	unilateral, exceed tonsils, adherent leaving bleeding when removed	Limited to tonsil, non adherent, no bleeding
Swab	- E diphtheria bacilli	Strep. hem.

* treatment of Diphtheria.

- ▀ Rest in bed, isolation untill 3 successive swabs are -ve
- ▀ Antitoxic serum 40000-100000 units (S.C. IV) according to age/severity
- ▀ Antibiotic (Penicillin)
- ▀ Prophylaxis by (DPT) vaccine

* Complication of Diphtheria:

- "Exotoxins of diphtheria have special affinity to nervous, cardiac & renal tissues.

(I). Nervous complication: (may occur after 2-3 wks)

1-head & neck: - Paralysis of soft palate (earliest & most common), paralysis of eye ms, pharyngeal ms, larynx.

2 - Chest ms: including diaphragm, (rarely limbs)

(II) - CVS compl.

- Heart failure $\begin{cases} \text{early: by toxic myocarditis, periph. circ. failure} \\ \text{late: by vagal neuritis.} \end{cases}$

(III): Resp. compl.

- respiratory obst by memb., descending inf. (bronchitis, ... etc)

(IV) - Renal compl.: acute nephritis (albuminuria).

(B) VINCENT'S ANGINA

* Definition: infection by fusiform bacilli & spirochaetes (*Borrelia vincenti*), usually affect tonsill but may $\rightarrow$ gum...

* symptoms: sore throat (gradual onset), mild fever & malaise

* Signs: - greyish-yellow false membrane of necrotic tissue & overlying ulcer (irregular & deep ulcer) over tonsills & usually unilateral (may exceed tonsil limits)
- enlarged tender cervical LN.

* investig.: swab $\rightarrow$ see causative organism.



* Treatment: systemic penicillin & bismuth, gargle.

(C) MONILIASIS ... (THRUSH)

- fungal infection of pharynx by *Candida albicans*, more in diabetics, debilitated childrens, AIDS pt. ... etc

- C/P: multiple thin white patches that easily removed.

- Treated by: - Antifungal: - nystatin local & systemic
- Gentian violet 1% solution (as paint)
- Good oral hygien.

* PARA-TONSILLAR ABSCESS (QUINSY)

- * **Definition:** abscess in peritonsillar space (bet. tonsil capsule & ms. bed)
- * **Pathology:** pus usually pass through crypta magna during acute tonsillitis → Peritonsillar space (mainly near upper pole).
- * **Symptoms:**
 - sever dysphagia (even can't swallow his saliva → drooping of saliva.
 - sever olalgia, sever sore throat.
 - Masseter spasm ^{Trismus} (pt unable to open mouth), torticollis
- * **Signs:**
 - enlarged oedematous tonsil & pitting oedema (pus).
 - Red tender soft palate, uvula, tender cervical LN
- * **Complication:** - spread infection laterally → Parapharyngeal abscess or downward → Laryngitis, septicemia, pyemia
- * **Treatment:**
 - ① I.V antibiotic, analgesia
 - ② Incision & drainage of pus.

NB: the incision is done midway of a line bet. uvula base & 3rd upper molar, or at most pointing point



* RETRO-PHARYNGEAL ABSCESS

- It may be chronic (cold abscess - TB vertebra) or acute

■ Acute retro-ph. abscess:-

- * **Aetiology:** Pus due to supp. of retroph. LN (of Henle) which tend to atrophy at 5 year [so occur in infant & young child]
- * **Symptoms:** fever, toxemia, dysphagia, stridor, torticollis
- * **Signs:** swelling in post wall of pharynx (unil), enlarged LN
- * **Treatment:** Antibiotic, incision & drain pus (even without anaesthesia) (head low + suction to avoid inhalation from inside).

■ Chronic retroph. abscess:-

- Cold abscess of TB behind prevertebral fascia
- Dx: x-ray, TB test
- Rx: Anti TB regimen, drain pus from outside

TONSILLECTOMY

- * **Indication:-**
- 1 - repeated attack of acute tonsillitis (commonest indicat.)
 - 2 - One attack of Quinsy.
 - 3 - Diphtheria carriers who resist Rx.
 - 4 - Chronic tonsillitis when TB suspected
 - 5 - chronic tonsillitis acting as septic focus (Rh. fever _{G.N.})
 - 6 - chronic tonsillitis (hypertrophic) → difficult swallow, breath
 - 7 - Tumours of tonsils
 - 8 - FB in tonsil (N.B. 6, 7 are absolute ind.)

- * **Contraind:-**
- ① Blood disease (hemophilia, leukemia) ⇒ absolute contra
 - ② During acute attack.
 - ③ During upper resp. infection.
 - ④ During rheumatic fever or epidemic of polio.
 - ⑤ During active systemic dis (DM, TB, HIV)

* **Complication:-** may be complicated by -

- 1 - haemorrhage (1st reaction or 2nd).
- 2 - Pulmonary compl. as obst., infection
- 3 - injury to palate, uvula, dental, etc
- 4 - incomplete removal.
- 5 - infection :- - otitis media, paraph. abscess
- Bacteremia, endocarditis, nephritis.

ARTERIAL SUPPLY OF H&N

